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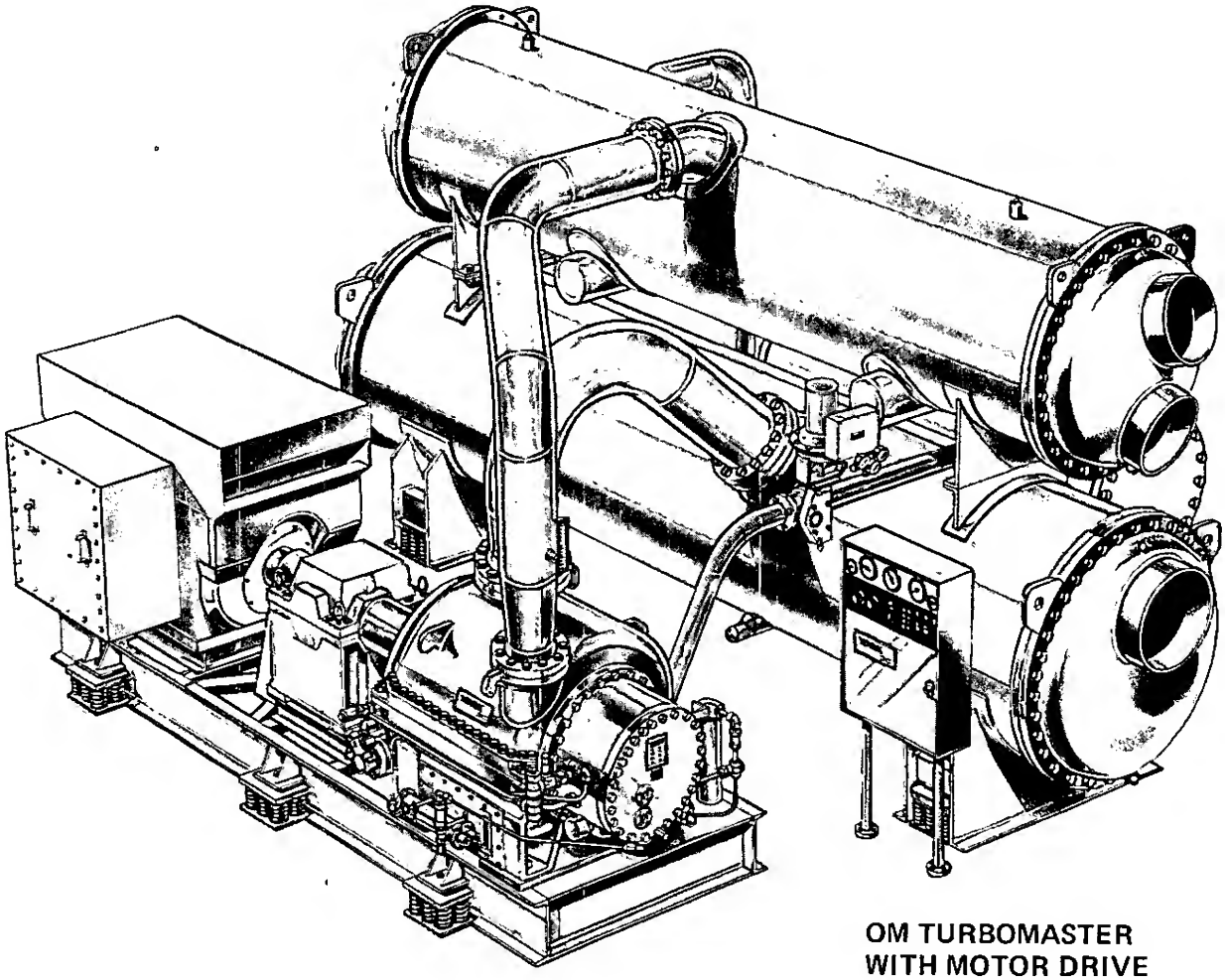
FORM 160.71-EG1 (579)

YORK®

TURBOMASTER

CENTRIFUGAL LIQUID CHILLING UNITS

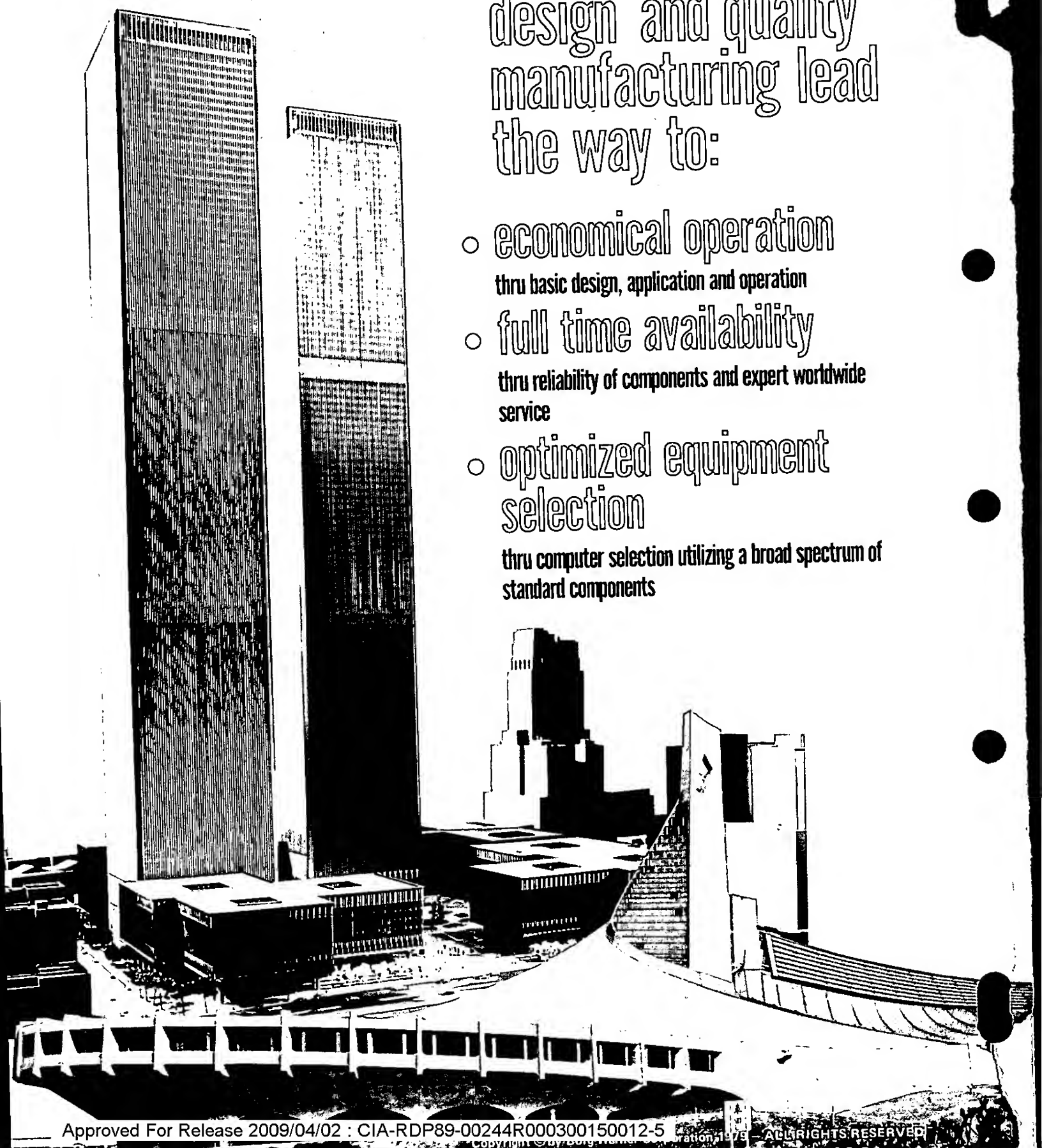


OM TURBOMASTER
WITH MOTOR DRIVE

1000 THRU 8500 TONS

experience... energy saving design and quality manufacturing lead the way to:

- **economical operation**
  thru basic design, application and operation
- **full time availability**
  thru reliability of components and expert worldwide service
- **optimized equipment selection**
  thru computer selection utilizing a broad spectrum of standard components



FORM 160.71-EG1

experience promotes leadership

Large tonnage air conditioning and refrigeration units have been manufactured by YORK since the early 1940's. The early experience in design, application, quality manufacturing, and maintenance of this type of equipment led to the development of the OM Turbomaster Units, its basic design being used for almost 20 years. The first unit with 1000 tons capacity gradually increased year by year to the present span of 1000 to 8500 tons. This wide capacity range was the result of improved design, and construction methods, and most important, it met the demand of a growing market. At the present time over 1,000,000 tons or 500 Turbomaster Units have been installed and are operating worldwide.

OM Turbomaster units have been used to cool large individual buildings, central plants for building complexes and district cooling, and for industrial processes of all types. Some of the worlds largest buildings such as the . . . World Trade Center, New York City . . . Renaissance Center, Detroit, Michigan . . . Capital Power, Washington, D.C. . . . University of Texas . . . National Gym, Tokyo, Japan . . . and The Frankfurt Main Airport, West Germany . . . are cooled by OM Turbomasters.

application flexibility

OM Turbomaster units can be applied in many ways and with many modifications to suit the most intricate application. These machines can be driven by induction or synchronous electric motors, steam turbines or gas turbines.

choice of energy savers

For the energy conscious market "YORK Free Cooling" (compressorless cooling) is available, with up to 60% design load operation. This modification is used during those periods of the year when the available condenser water temperature is lower than the required chilled water temperature.

Heat recovery, another energy saver, is available for the reclamation of heat from condenser water. A modified split-bundle shell and tube condenser is used for this application.

For those places of the world where water is scarce, the OM Turbomaster can be applied with an air cooled condenser, thereby eliminating the need for water in the condensing portion of the air conditioning cycle.

industrial applications

OM Turbomaster units can also be selected and manufactured to meet many industrial applications, such as chemical and petrochemical processes, brine cooling, mine applications, etc. The uses are practically unlimited.

YORK TURBOMASTERS CONFORM WITH ARI STANDARD 550 FOR CENTRIFUGAL WATER CHILLING PACKAGES

YORK leader in centrifugal design

YORK has many years of experience in design, application and quality manufacturing of the OM Turbomaster Liquid Chilling Units. Flexibility of design, a result of many component combinations and computer selections, has created an infinite number of units to satisfy almost any condition and size to suit the most exact job specification.

When choosing a centrifugal liquid chilling unit, look to YORK . . . . . the Leader in Centrifugal design.

economical operation

equipment selection optimized

The YORK Turbomaster operates economically throughout the year and over the life of the equipment because of its highly flexible design. Each unit is optimized to suit each unique job requirement utilizing the YORK experience with every type of application.

Turbomaster units are perfectly selected to suit each individual job application, physical area size, and location. A wide base of standard components have been designed to meet every possible selection through use of the YORK Turbomaster Computer Program. See Page 14.

lower power demand and operating costs

The Turbomaster Unit is engineered to operate efficiently with reduced entering condenser water temperatures usually available during most of the operating year. Power consumption falls as condenser water temperature drops, thus lowering operating costs. Turbomaster's ability to operate down to approximately 60°F entering condenser water temperature reduces power usage tremendously as shown in the curve, Fig. 1.

steam turbine drive-controlled speed

A steam turbine incorporates a governor to automatically control its operating speed and is regulated by a temperature sensor which also controls the operation of the compressor's prerotation vanes. Controlled operation optimizes the turbine and the compressor speed to match the required head to further provide an operating cost savings.

outstanding part load operation with loadminder III

The ability of large tonnage units to operate at part load conditions is most important to economical operation. YORK units are equipped with effective fully automatic part load capacity controls. Automatic control of the hot gas by-pass in conjunction with the compressor's prerotation vanes (and speed control with steam turbine drive) coordinates their operation with the system head requirements (entering condenser water temperature) to minimize operating costs. The YORK multistage compressor with prerotation vanes is especially efficient in part load performance in the 30% to 100% capacity range which is most crucial to large tonnage units. Loadminder III also provides automatic safe control to 10% part load conditions, should it ever be required.

part load performance

The versatility of YORK's Computerized Selection Program for OM Turbomaster Units allows in-depth studies for part load evaluations where energy is of major concern. Typical part load performance is graphically shown in Fig. 1 depicting the reduction of compressor shaft horsepower (i.e., energy) as the required load is reduced, and the condenser water temperature falls. If a constant design water temperature is required (typically 85°F), then Curve 1 is typical.

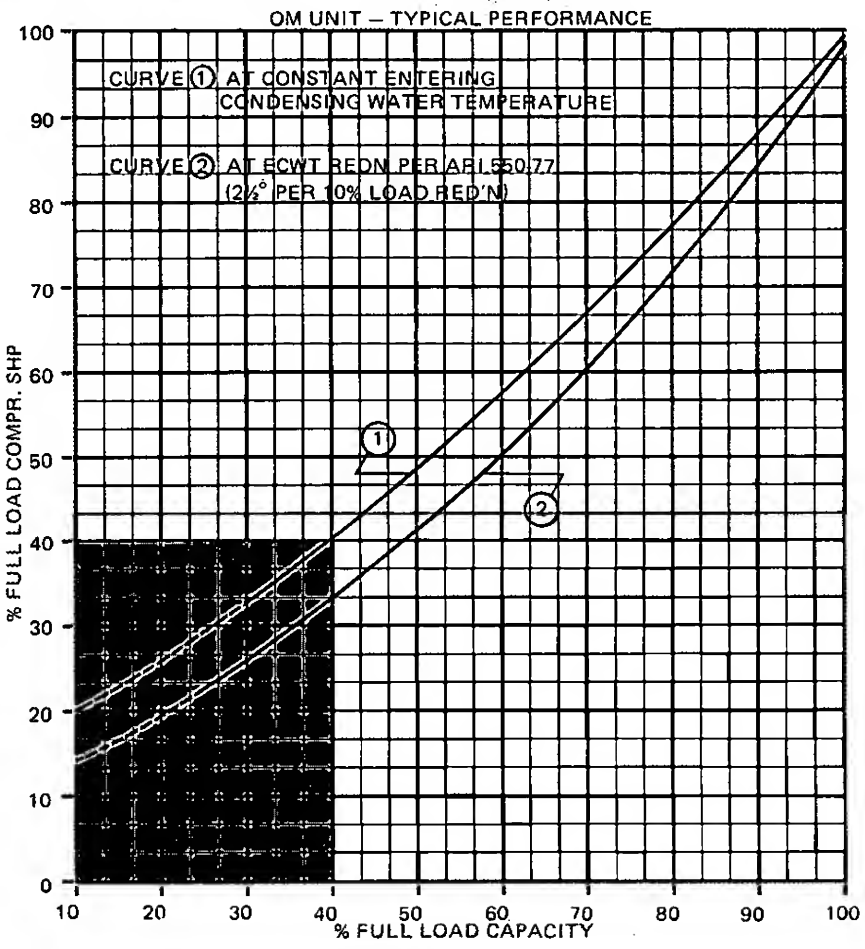


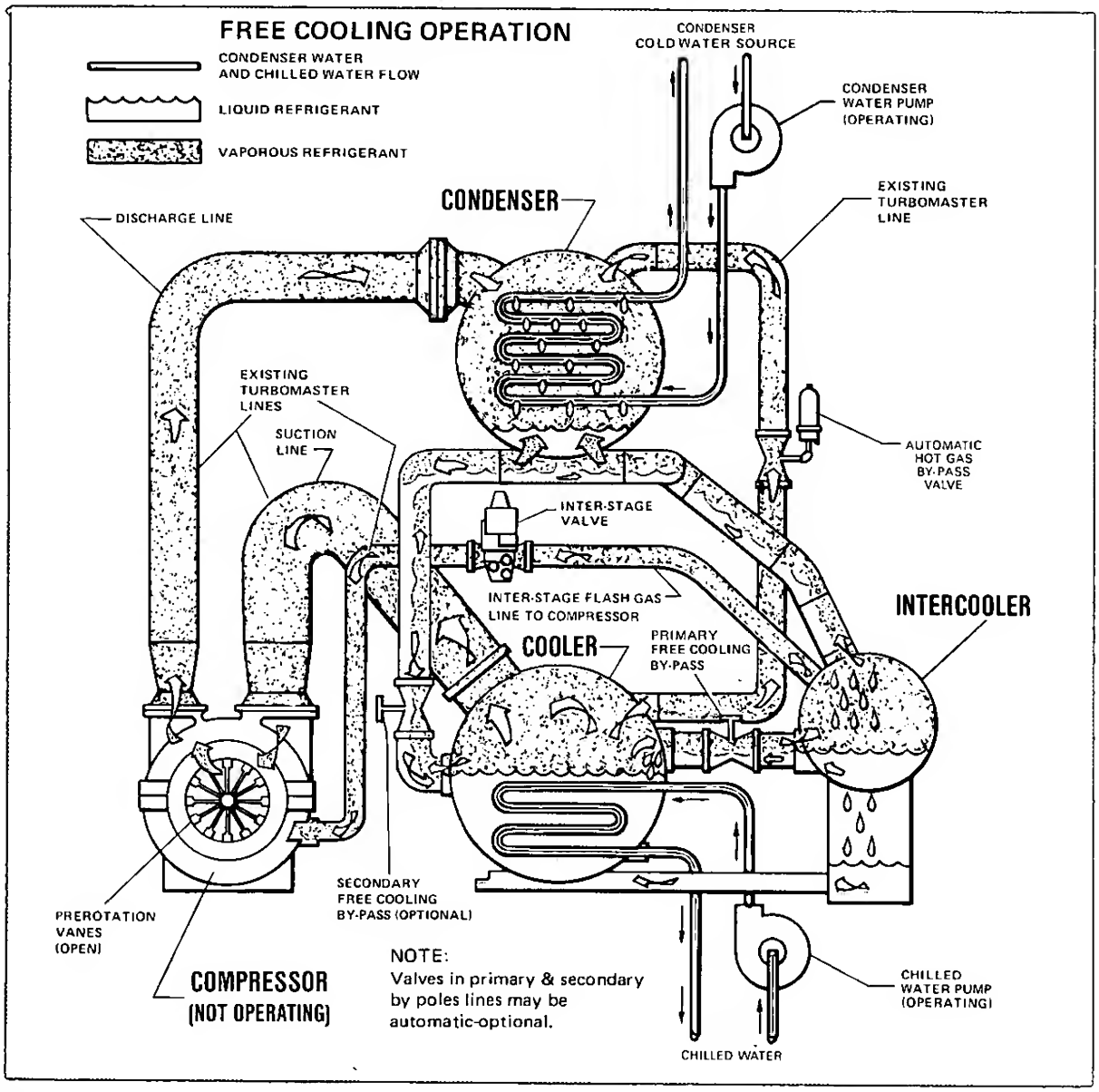
FIG. 1 – TYPICAL PART LOAD PERFORMANCE.

■ Performance dependent upon specific application conditions and equipment selected.

economy minded!

use YORK "free cooling"

The YORK FREE COOLING mode of operation is the most outstanding modification contributing to economical operation. Free Cooling is accomplished by eliminating the use of the compressor and allowing the free flow of refrigerant through a by-pass connection between the cooler, condenser and intercooler, with the compressor vanes open. The circulation of condenser water and chilled water, by simply operating their respective pumps, triggers the free cooling mode of operation. There are no additional refrigerant pumps or spray nozzle headers required for operation. An optional modification, it is utilized during those periods of the year when the available condenser temperature is lower than the required chilled water temperature. This mode of operation offered by YORK has almost doubled the capacity of the Turbomaster unit compared to competitive free cooling mode, and can save thousands of dollars in operating costs by eliminating the need to operate the compressor during these conditions.

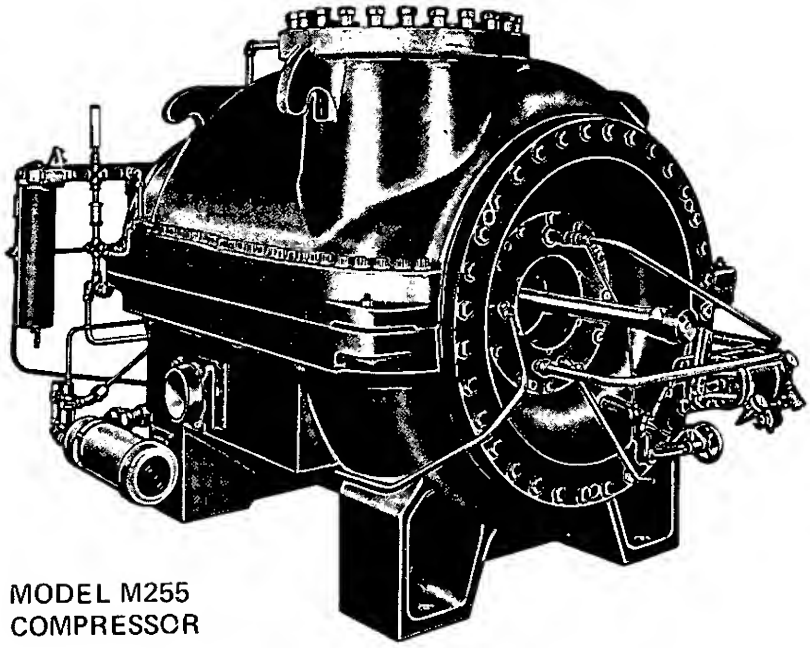


full time availability thru reliability

YORK experience in industrial compressor design gives the Turbomaster outstanding dependability. This unit is designed to meet the most demanding conditions and is computer selected to provide the exact capacity at all times, in all types of environments. Minimum maintenance and easy serviceability is engineered into its design. These outstanding features coupled with expert service and maintenance available thru the YORK worldwide service organization make this machine a leader in reliability.

compressor—proven in action

The heart of the Turbomaster Liquid Chilling Unit is the YORK Series M multi-stage compressor originally designed for heavy industrial duty. This compressor, since its development 25 years ago, has been proven in thousands of demanding applications for refrigerant and gas compression, using from 2 to 8 stages to suit the particular job. Proven in operation to deliver 24 hours a day continuous service, year after year, using all types of refrigerants and gases. The industrial process and refrigeration industries have chosen the M compressor for its outstanding reliability. This same dependable compressor now provides 1,000,000 tons of air conditioning all over the world.

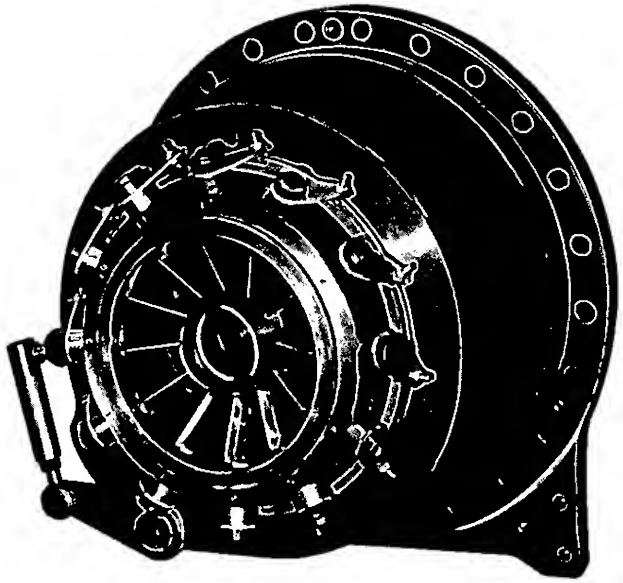


MODEL M255
COMPRESSOR

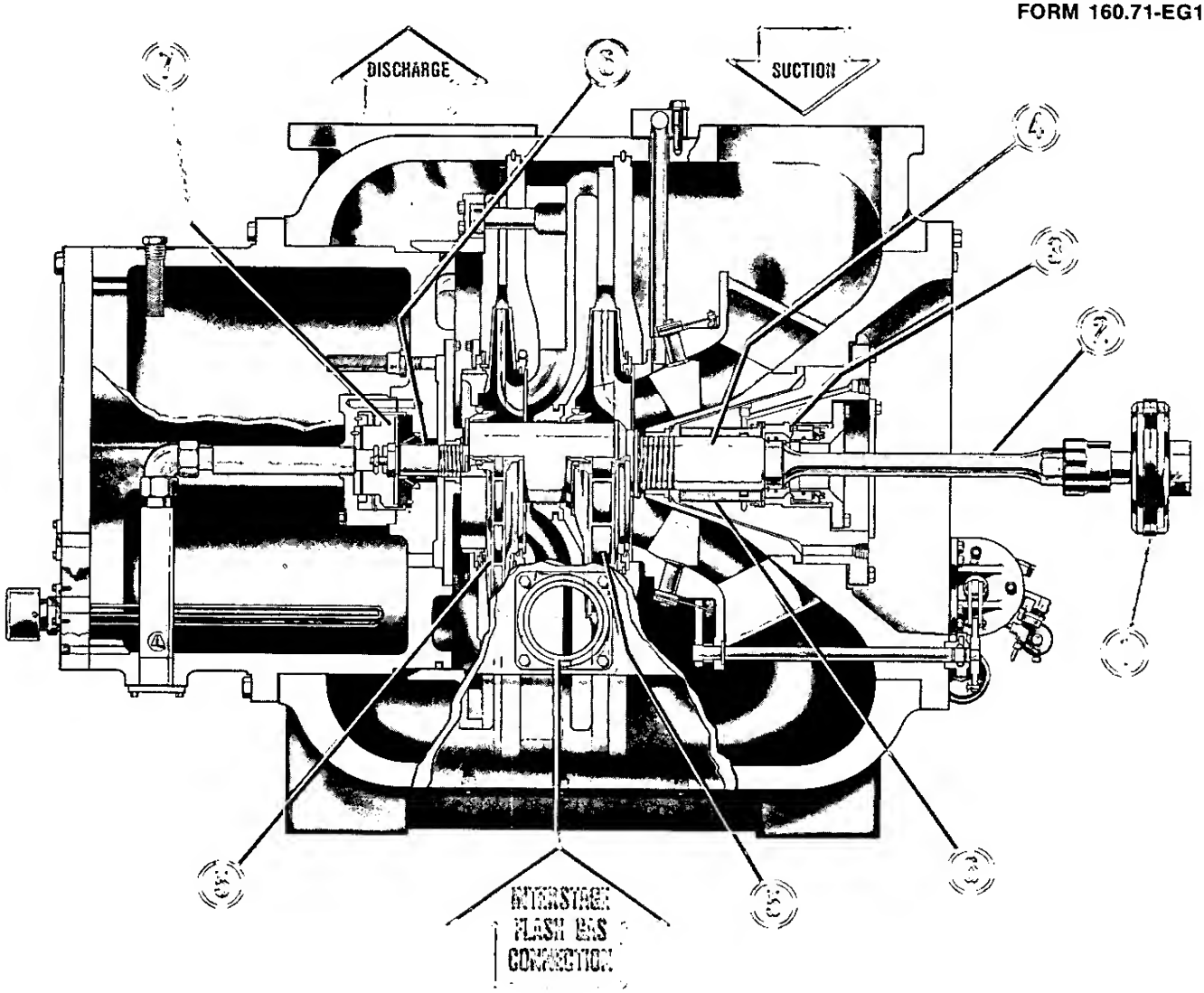
The casing of the compressor is rugged in construction, fabricated of cast iron, and horizontally split for accessibility. The top half of the casing lifts off to permit access to all internal parts without disturbing shaft alignment. Access to seals is easy since lifting the top half of the casing is not necessary. The internal oil pump is also removable without removing the top casing or disassembling the drive shaft.

Prerotation vanes, located on the suction end, provide efficient full and part load performance at all times during compressor operation. Pneumatic controls automatically position the vanes to maintain the desired chilled water temperature as the load varies. A manual handwheel to control prerotation vanes is also furnished for emergency operation.

For more efficient operation, the Turbomaster compressor includes a side connection that introduces intermediate flash gas. This flash gas is taken from the intermediate stage of the intercooler (see page 11).



PREROTATION
VANES



The following compressor features contribute to the Full Time AVAILABILITY and Reliability of the Turbomaster Liquid Chillers.

(1) **YORKFLEX COUPLING** – is simple in design, light in weight, does not transmit vibration during compressor operation, requires no lubrication and no maintenance for a long operating life.

(2) **QUILL-TYPE DRIVE SHAFT** – is torsionally flexible, small in diameter and designed for the transmission of large horsepowers. The shaft is capable of absorbing torsional vibration.

(3) **OIL SEAL** – because of the small diameter drive shaft the oil seal's diameter is also smaller, lighter, and flatter contributing to low rubbing speed for more dependable and longer seal life. The seal is spring loaded for complete sealing at all times.

(4) **MAIN SHAFT** – the impeller is attached to the shaft with individual collets and spring ring clamps to eliminate stress concentration and fatigue points. The impellers are centered on the shaft and are not affected by centrifugal stress or temperature rise. The shaft is short and stiff with a minimum span between the journal bearings, designed with minimum deflection and vibration.

(5) **IMPELLERS** – precision designed, balanced, efficient in operation, resist erosion and corrosion, and maintain their initial performance through many years of service.

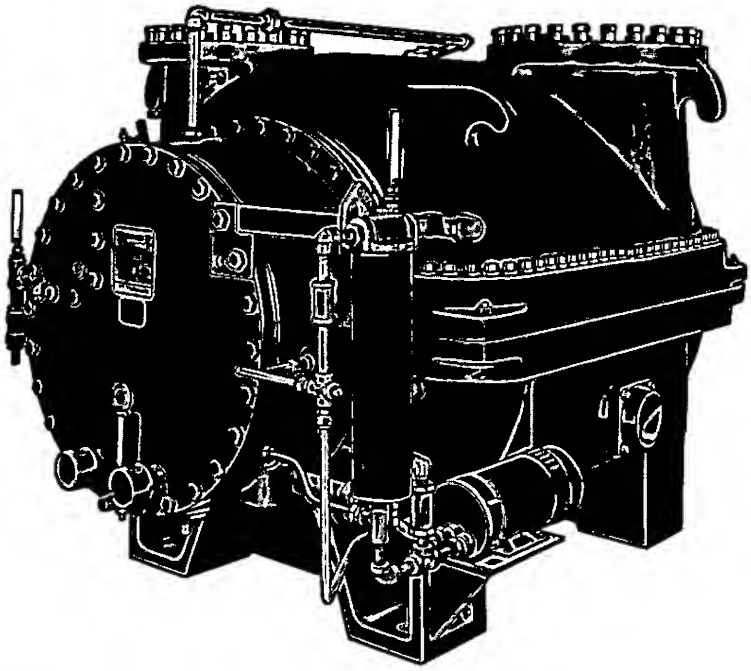
(6) **JOURNAL BEARINGS** – simple, small diameter, precision bored, insert type aluminum alloy bearings. The drive shaft rotates on an oil film without any contact on the bearing surface. This contributes to less wear and quiet operation.

(7) **OIL PUMP AND THRUST BEARING** – main oil pump is mounted directly on the rotor shaft assuring forced feed lubrication to all bearings during compressor operation. Thrust bearing is a hydrodynamic film type pocket bearing.

positive lubrication even during power failures

YORK Turbomaster compressor includes a force feed positive lubrication system that supplies oil prior to start-up, during operation, and coastdown.

The main oil pump is shaft mounted providing oil pressure during compressor operation, shutdown, and even during a power failure. Oil pressure prior to and during start-up if furnished by the electrically operated auxiliary oil pump. This pump shuts off automatically during normal operation.

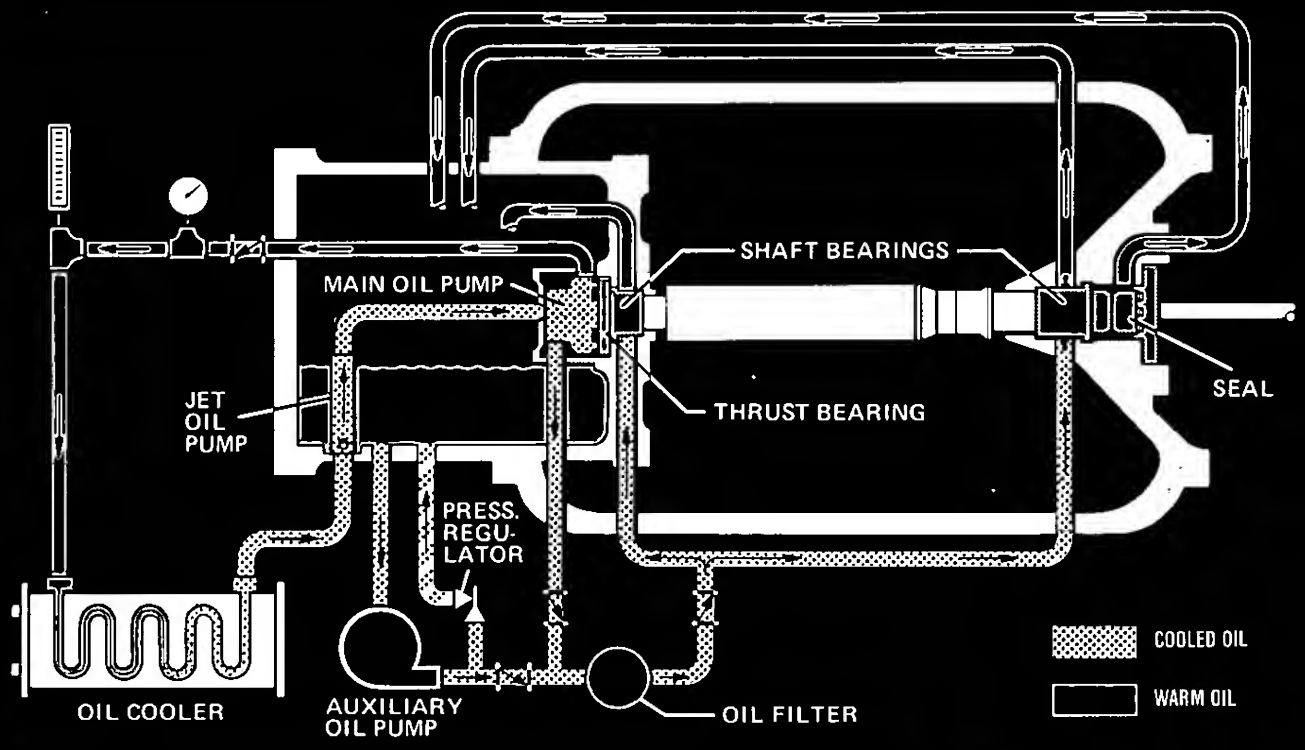


A 15 micron replaceable oil filter continuously filters oil at all times during operation. This filter is easily replaced by closing a service valve. A water cooled external type shell and tube oil cooler maintains oil at the proper operating temperature.

An integral oil sump maintains an adequate supply of oil for continuous operation. Sight ports are provided in the sump for the observation of the oil level. The lube system also contains a high oil temperature thermostat located in the thrust bearing oil discharge line.

A low oil pressure cutout and an oil pressure gauge are provided to shutdown the unit on low oil pressure and to read the operating oil pressure. Oil heaters are provided to maintain a constant temperature in the oil sump to minimize refrigerant accumulation in the oil during shutdown.

The lube system is completely self contained, internally vented, factory assembled, and piped to the compressor, to assure a completely sealed system free from foreign particles. Positive lubrication means longer life and full time unit availability and reliability.



YORK

drive line base and assembly

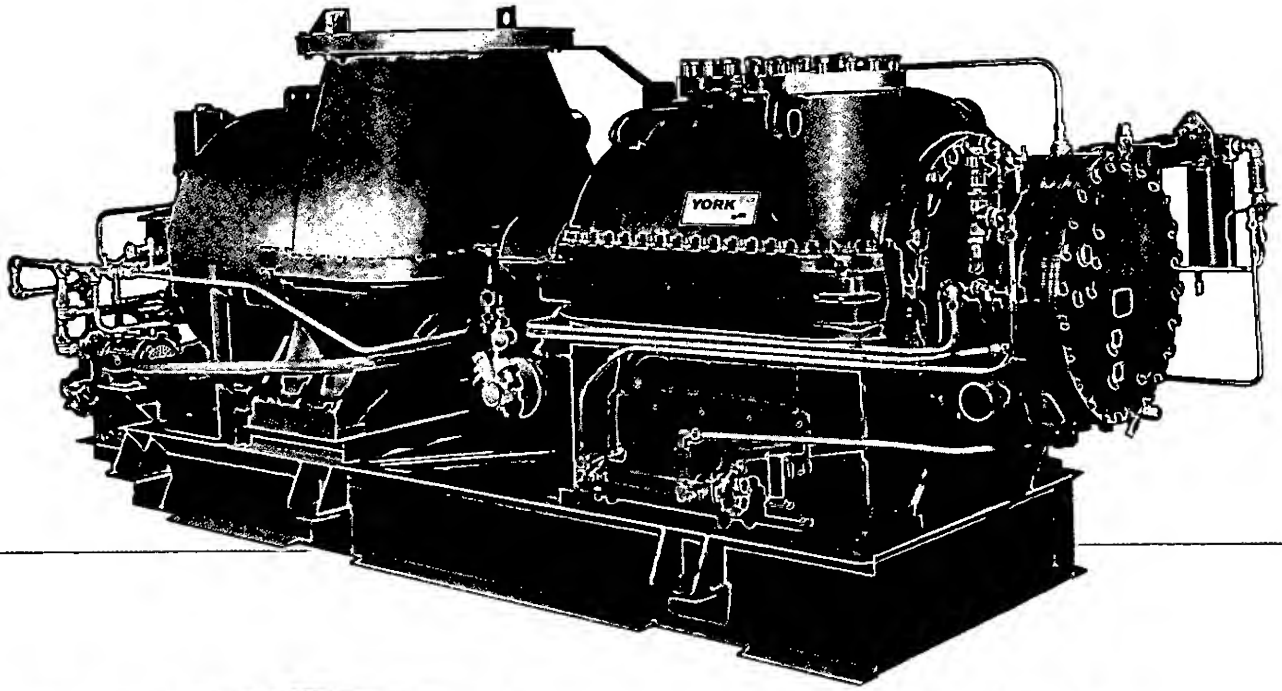
completely factory assembled—saves installation costs and promotes reliability

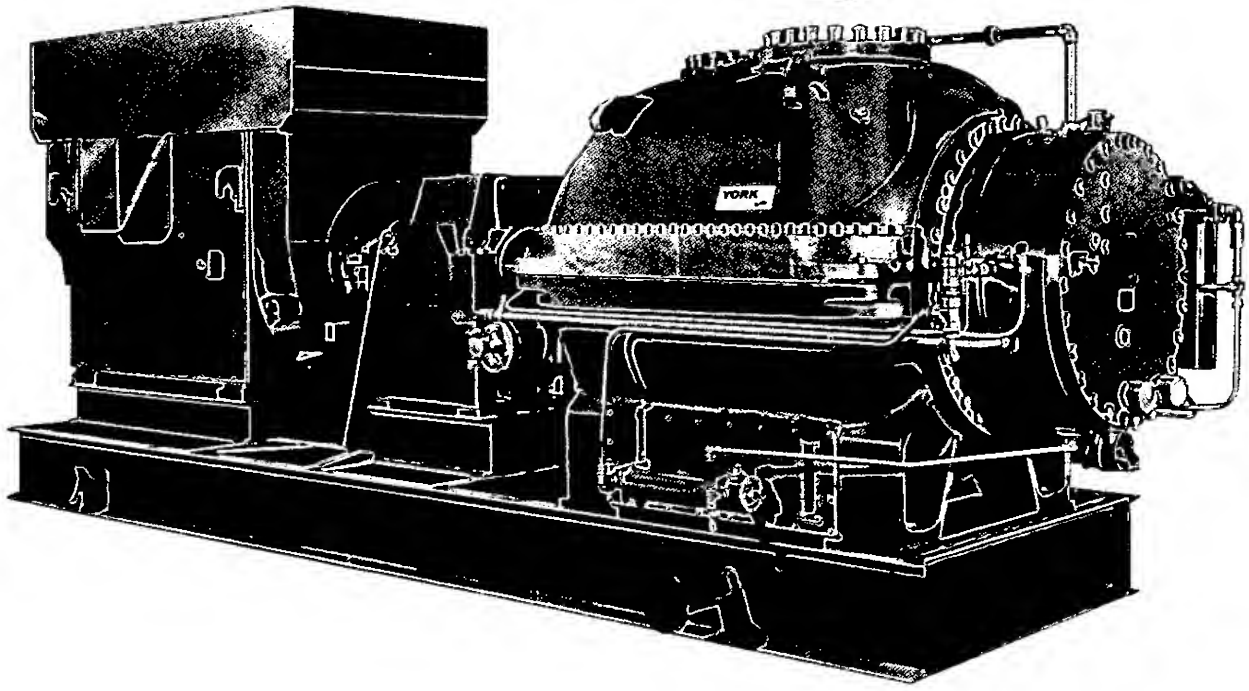
For simpler — easier — less expensive installation — the compressor and driver (motor and gear, or steam turbine) are completely assembled to a rigid fabricated structural steel base. These components are rough aligned and shallow dowelled by factory experts, then shipped as a single assembly. Only final alignment and dowelling is necessary after the completion of the unit field installation. Oil cooler water piping and necessary valves are factory assembled to a common header on the drive line base. Piping and valves are arranged to facilitate oil cooler tube inspection and cleaning.

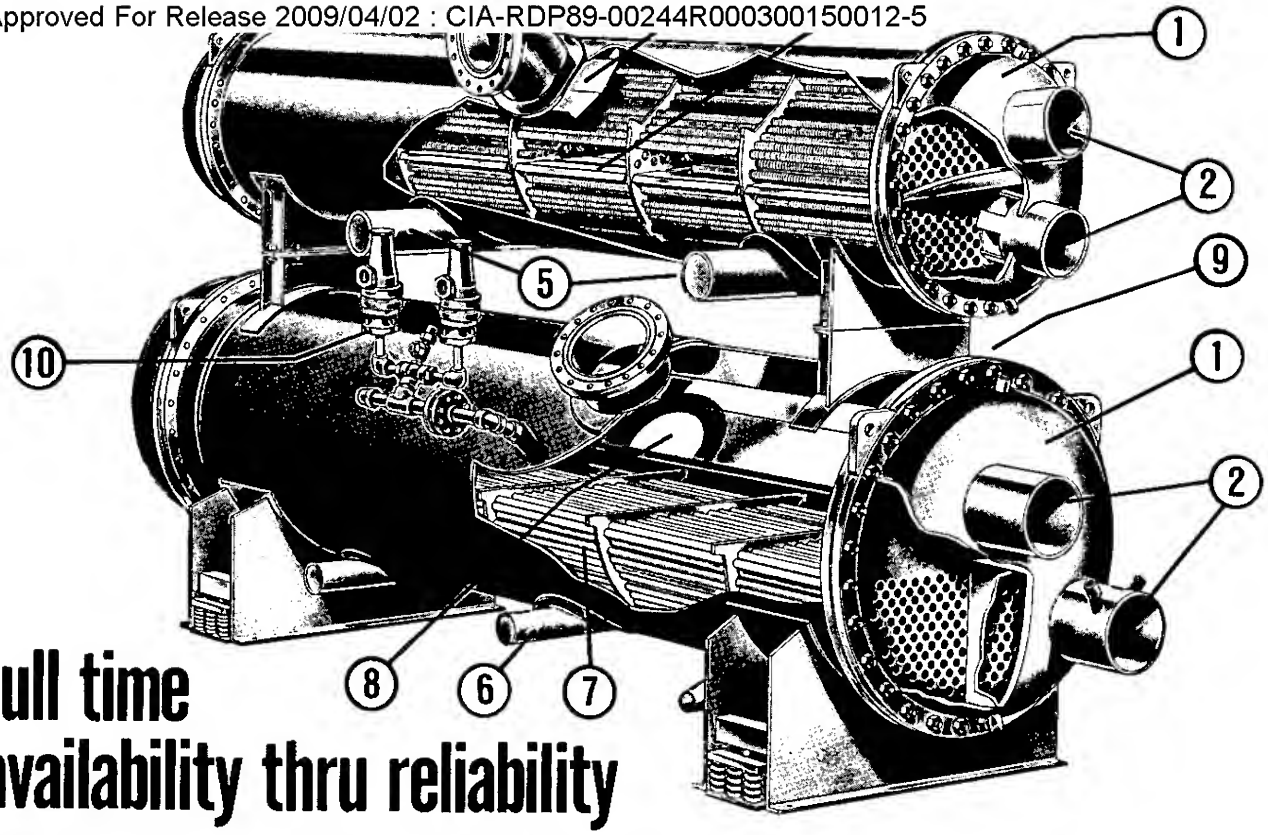
The high and low speed couplings are provided with guards in accordance with the OSHA standards.

motor lubrication piping

Some motors require a continuous supply of cooled filtered oil. Arrangements can be made to supply necessary piping and valves from the speed increaser gear oil piping, included as part of the overall factory drive line assembly.







full time availability thru reliability

YORK has proven experience in shell and tube design, and pressure vessels of all kinds. This experience has led to our present design concepts to insure a lifetime of complete reliability and the application of more efficient heat exchange methods. YORK coolers, condensers, intercoolers and pumpout storage receivers include the latest design, manufacturing, and testing procedures. All pressure vessels including those with refrigerant and water circuits have been designed, fabricated, and tested in accordance with the ASME-Section VIII Code for Unfired Vessels and the ANSI-B9.1 Safety Code.

cooler and condenser

(1) Coolers and condensers are furnished with simple light weight, easy to handle compact water boxes. Adjacent access to tube sheets for inspection and maintenance is accomplished by simply removing the compact water boxes. Marine water boxes, either integrally welded or bolted-on, can be provided in lieu of the compact type.

(2) A variety of water pass and nozzle arrangements are available to suit most water piping arrangements. Weld stub connections are provided for simple and easy connection of water piping. Nozzle baffles are arranged to prevent direct water impingement on tubes.

condenser

(3) Condenser discharge inlet baffle distributes refrigerant gas uniformly over the tube bundle. This baffle prevents direct impingement on tubes.

(4) Condenser liquid drain baffles keep individual tube bundles drained of liquid refrigerant for more efficient condensing.

(5) Dual liquid drains improve condenser drainage by carrying away liquid refrigerant to prevent poor condensing caused by flooded tubes. Good refrigerant drainage also reduces the refrigerant charge.

cooler

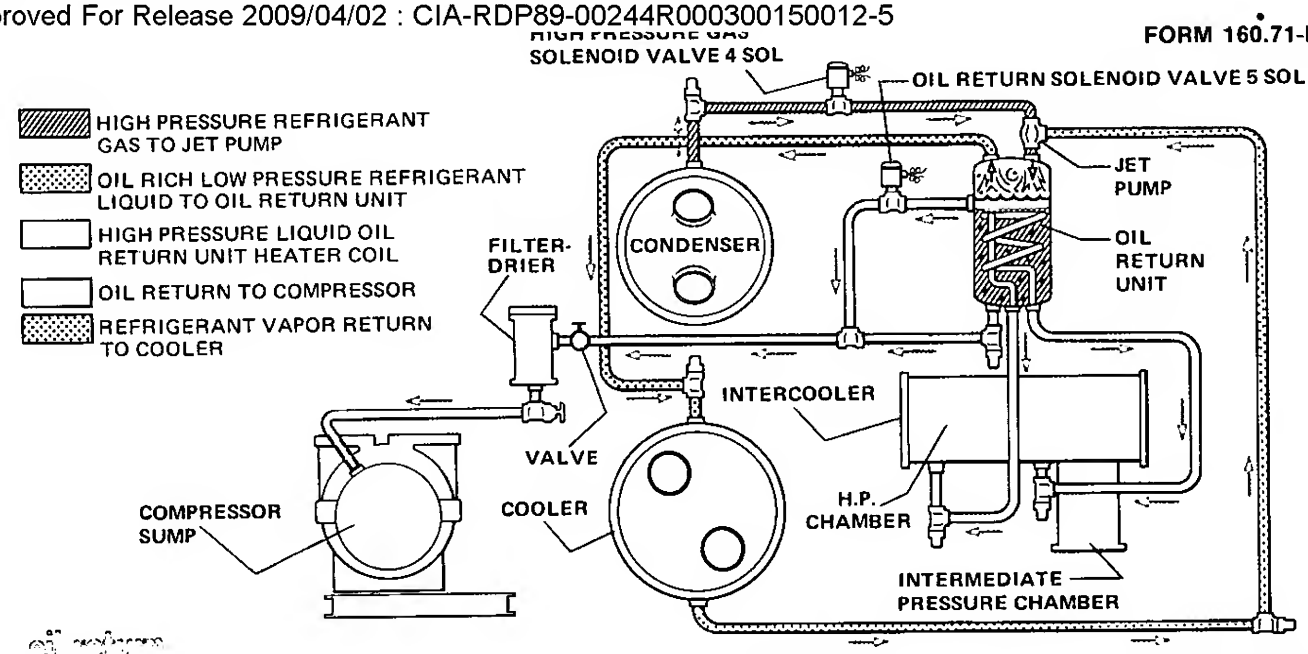
(6) For the most efficient unit performance at all load conditions a refrigerant liquid feed system distributes liquid refrigerant evenly to completely surround all tubes under all load conditions.

(7) YORK "High Flux" nucleate evaporator tubes are the most advanced heat exchange surface in the industry. This surface operates at significantly lower temperature differences than conventional finned tubes resulting in a reduction in the total temperature lift (head) against which the centrifugal compressor must operate. The end result is lower KW (BHP) per ton power consumption at all conditions. High Flux nucleate boiling surface contributes to: (1) lower operating costs; (2) superior free cooling performance; (3) expanded application flexibility; (4) greater reliability; (5) reduced size, weight and refrigerant charge.

(8) Suction baffle provides uniform smooth suction vapor flow to suction connection for outstanding evaporator performance. Vertical separation space above the tube bundle plus a flow direction change prevents liquid carryover to the compressor. Liquid carryover results in loss of efficiency. (Dual suction connections are used on 22 ft. and longer coolers.)

(9) Cooler sight ports for observing evaporator operation. (Not shown on illustration.)

(10) System Relief Arrangement - YORK HC High Capacity relief valve(s) connected in series with bursting disc(s). Valves are sized to suit application in accordance with the ANSI B9.1 - Safety Code. The bursting disc provides a leak tight shut-off unless an over pressure condition occurs. The relief valve provides shut-off as soon as over pressure condition is relieved, minimizing loss of valuable refrigerant.



oil return
it maintains evaporator efficiency

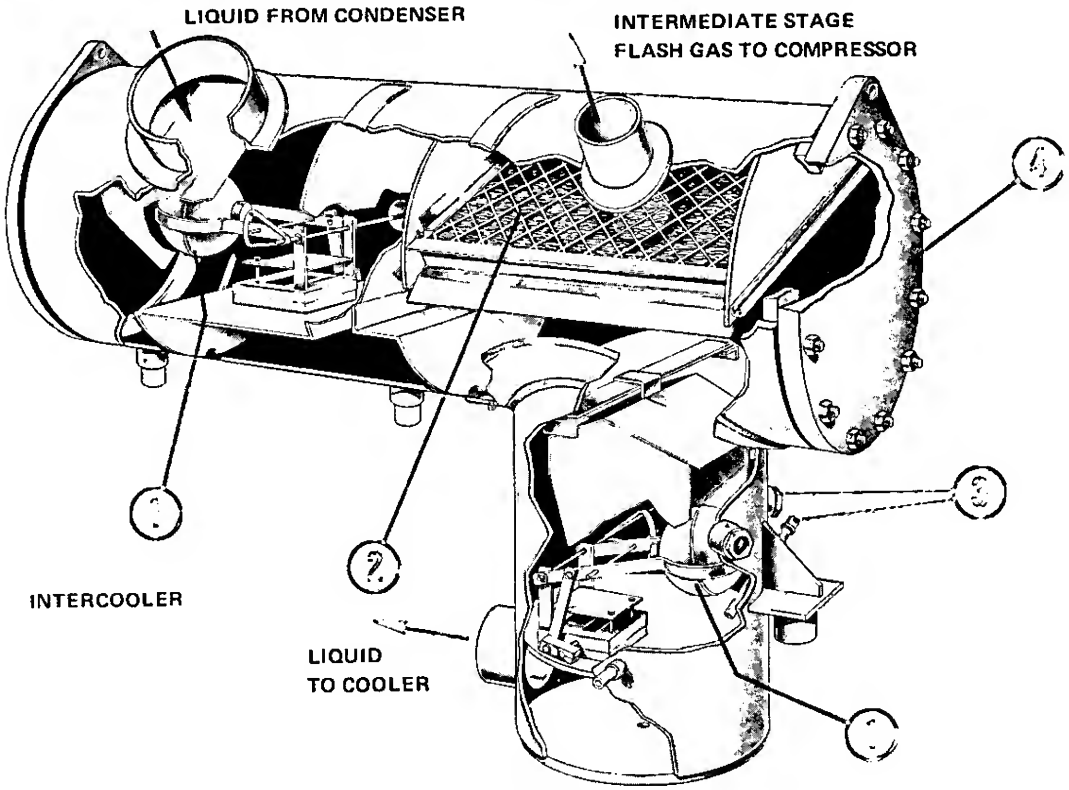
YORK recognizes that any compressor-unit design results in oil migration to the cooler. This loss of oil not only requires periodic replacement of compressor oil, but more important, the accumulation of oil in the cooler begins to adversely affect its efficiency.

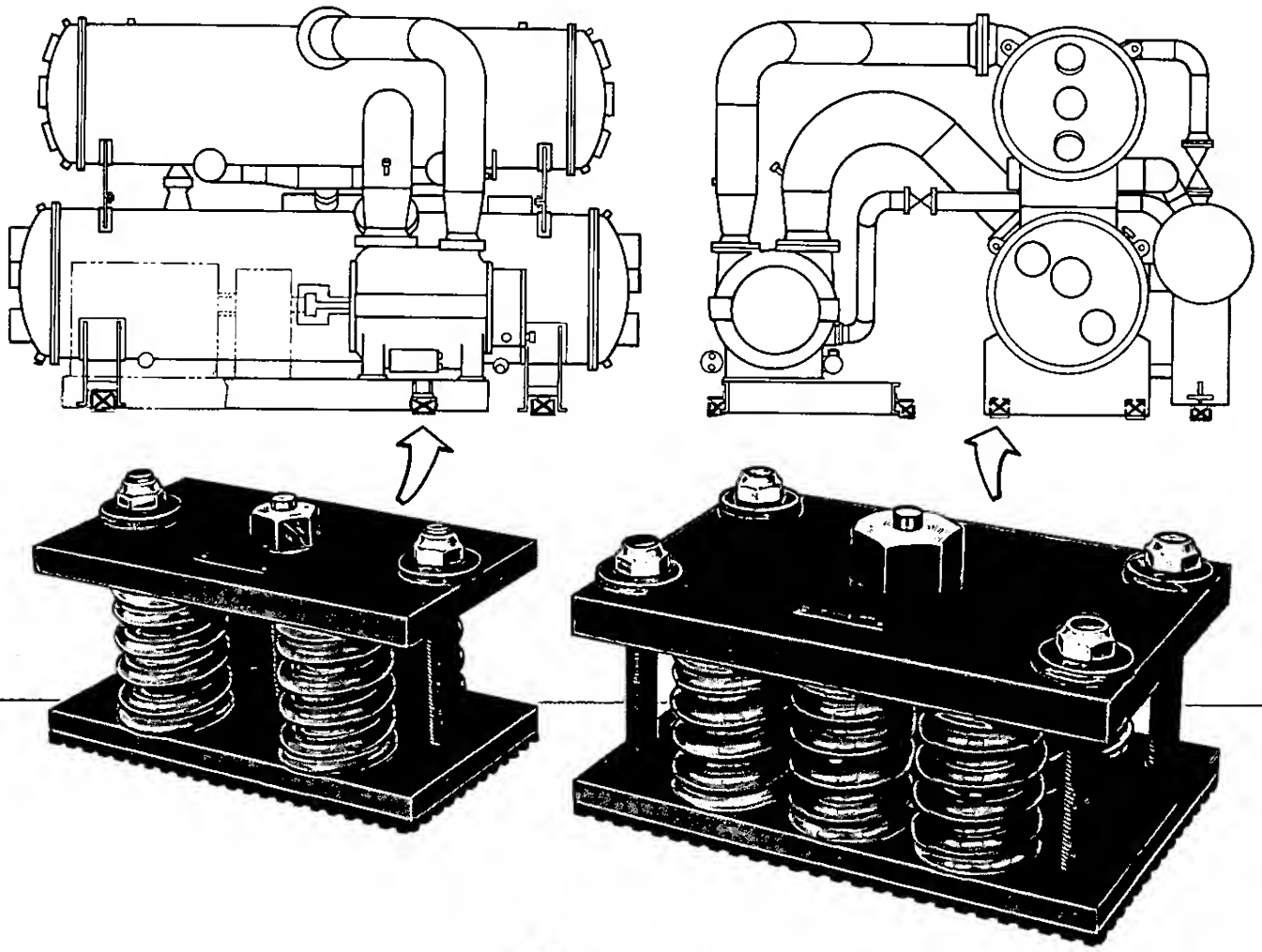
YORK Turbomaster units include a simple automatic oil return system controlled automatically, continuously returning oil to the compressor. The concentration of oil in the cooler is automatically kept below 1/4% and the oil is returned to the compressor. This system maintains peak heat exchange performance of the cooler, while minimizing the need for compressor oil make-up. Another reliability feature through experienced design.

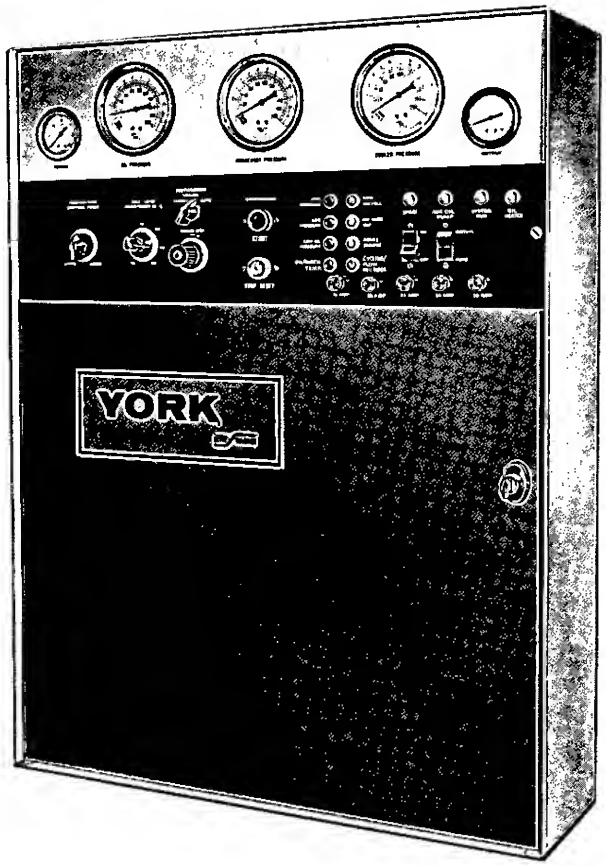
intercool

The YORK single stage flash type intercooler provides an overall gain in chilling unit efficiency of 6% - 8% and is located in the liquid line between the condenser and cooler. Intercooler features include:

1. Simple free action float valves meter refrigerant liquid flow through the intercooler. Valves can be externally adjusted.
2. Mist eliminators prevent liquid carryover from entering the interstage flash gas connection to the second stage of the compressor to maintain optimum efficiency.
3. Sight ports and thermometer wells permit observation of intercooler operation.
4. Removable end covers provide easy access for inspection and maintenance.







spring type vibration isolators

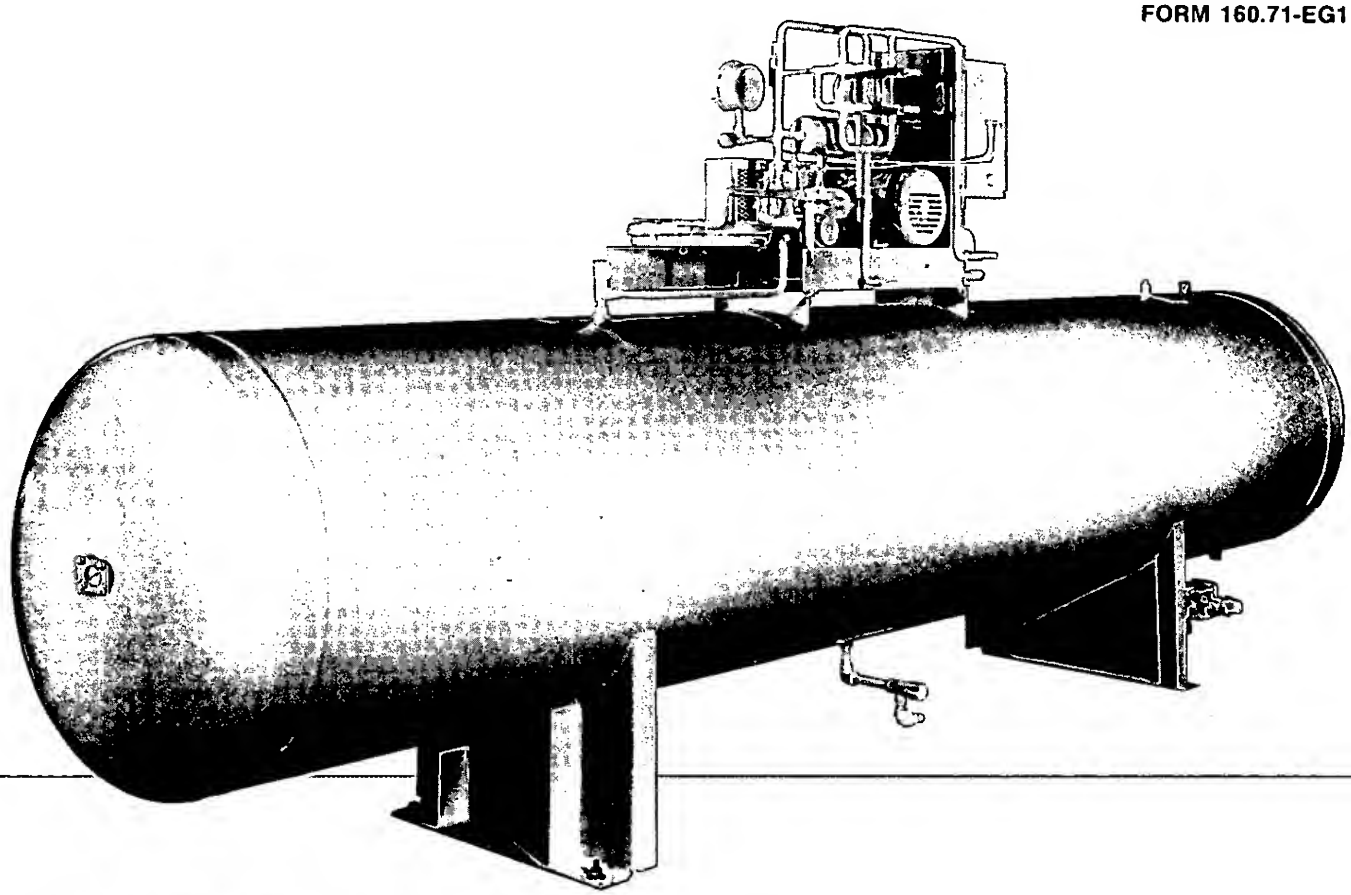
Simplifies and lowers cost of unit installation. Eliminates the cost and construction of heavy concrete foundations. Simplifies the overall building structure and the cost of installing and aligning individual drive line components.

Turbomaster liquid chilling units are completely mounted on spring type level adjusting vibration isolators. The isolators are specially designed for 1" deflection and limited rise and can be load adjusted. Neoprene base pads are included for optimum isolation of vibration to prevent transmission of sound within the building structure.

control center

The YORK Custom Designed Control Center contains all basic controls and logic for fully automatic operation and safety protection of the Turbomaster Liquid Chilling Unit. The center also includes specific controls for the selected drive (motor or steam turbine). All controls are completely integrated into one package, factory assembled, internally wired, piped, and factory tested.

The control center also includes oil pressure switch, pressure gauges, and indicator lights to display basic operation and safety functions. The hinged door and lock prevents tampering with controls and provides easy access for inspection and maintenance. The control center can be custom designed to meet the specific needs of each installation.



refrigerant transfer unit and pumpout storage receiver

The Refrigerant Transfer and Storage Unit permits transfer and storage of refrigerant during inspection, maintenance or servicing of Turbomaster liquid chilling unit.

The Pumpout Receiver is sized to serve an individual chilling unit or multiple units using a common refrigerant. Each receiver includes integral floor mounting stands, dial-type liquid level gauge, and bursting disc with dual relief valve arrangement per ANSI-B9.1 Safety Code.

The compressor type refrigerant transfer unit includes a starting contactor or starter, all necessary safety and operating controls, factory mounted and piped on the storage receiver. Each unit has a valve manifold for liquid and gas transfer between the chilling unit and storage receiver.

Transfer and pumpout storage units are designed for location and mounting independent of the liquid chilling unit.

Factory supervised Installation, Initial Start-Up, Maintenance, and Service—Insures many years of Reliable Operation.

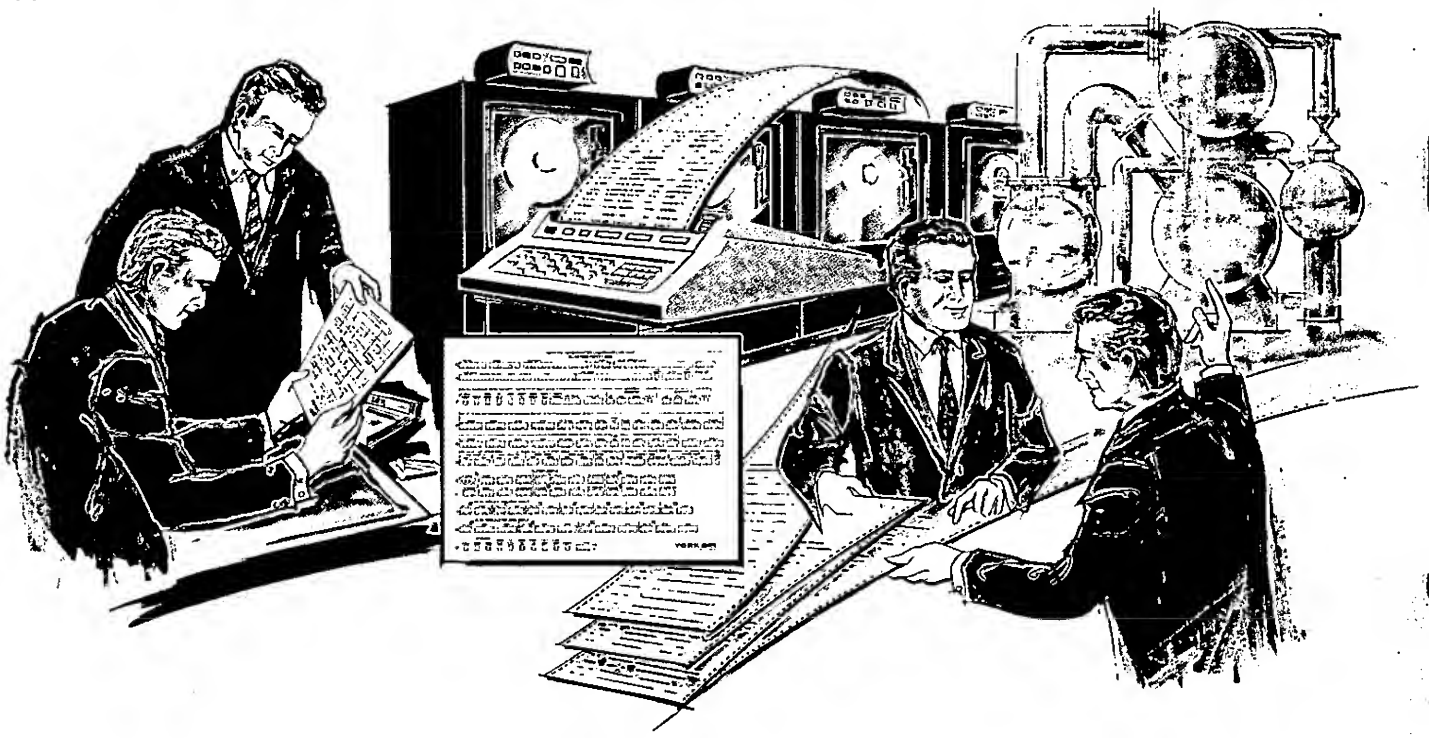
START-UP SUPERVISION — YORK factory trained service engineers will supervise the final system check out, drive line alignment, leak testing, refrigerant charging, initial start-up and adjustment for a minimum of five (5) days for the first unit, plus three (3) days for each additional unit. In addition, this expert will concurrently train the user's operating personnel in proper start-up, operation, maintenance and service procedures.

INSTALLATION SUPERVISION — When desired, YORK can provide factory trained specialists to supervise other personnel installing the Turbomaster Liquid Chilling Units.

INSTALLATION — YORK will furnish at additional cost, supervision and labor for the complete installation of Turbomaster liquid chilling unit in most parts of the world, if so desired by customer.

YORK SERVICE AND PARTS — Trained YORK personnel are as close as your telephone to advise, supervise or conduct any maintenance or service that may be required. A complete supply of parts available from the factory for shipment to any part of the world.

YORK CERTIFIED MAINTENANCE SERVICE —Certified maintenance contracts are available in the United States and many parts of the world. This service assures that your Turbomaster is operating at peak performance . . . for complete full time availability and reliability.



optimized equipment selection

component flexibility thru York Turbomaster Computer Program

The YORK Turbomaster Unit is an optimized custom combination selected from a vast array of standardized components to best meet the design criteria and unique requirements of each specific job.

- **COOLERS** — 11 diameters — 8 lengths — 118 tube bundles — 30 types of tubes (material, wall, surface) — 3 pass arrangements — multitude of water nozzle arrangements — water boxes.
- **CONDENSERS** — 14 diameters — 8 lengths — 78 tube bundles — 26 types of tubes (material, wall, surface) — 3 pass arrangements — multitude of water nozzle arrangements — water boxes.
- **COMPRESSORS** — 3 basic sizes, each with 2 impeller diameters and 3 impeller width combinations, RPM as required. Two stage compressor for most normal air conditioning duties, three stage for some brine cooling, air cooled condensing and other high head applications.
- **INTERCOOLERS** — 8 sizes.
- **REFRIGERANTS** — 3 — (R-12, 500, 22 to 3500 tons) (R-500, or 22 to 5000 tons) (R-22 to 8500 tons).
- **REFRIGERANT PIPING** — Sized for optimum unit efficiency.

The YORK Turbomaster Unit Computer program, operating within the design parameters set for each specific application, optimizes component combinations from among the million or more possibilities to provide:

- **LOW FIRST COST (LFC) OR LOW OWNING AND OPERATING COST (OOC)** — A series of Unit selections at progressively lower total owning and operating costs (higher first cost/lower operating cost) when necessary. Evaluation criteria can be defined.
- **PART LOAD PERFORMANCE**
- **ESTABLISH "FREE COOLING" CAPABILITIES**

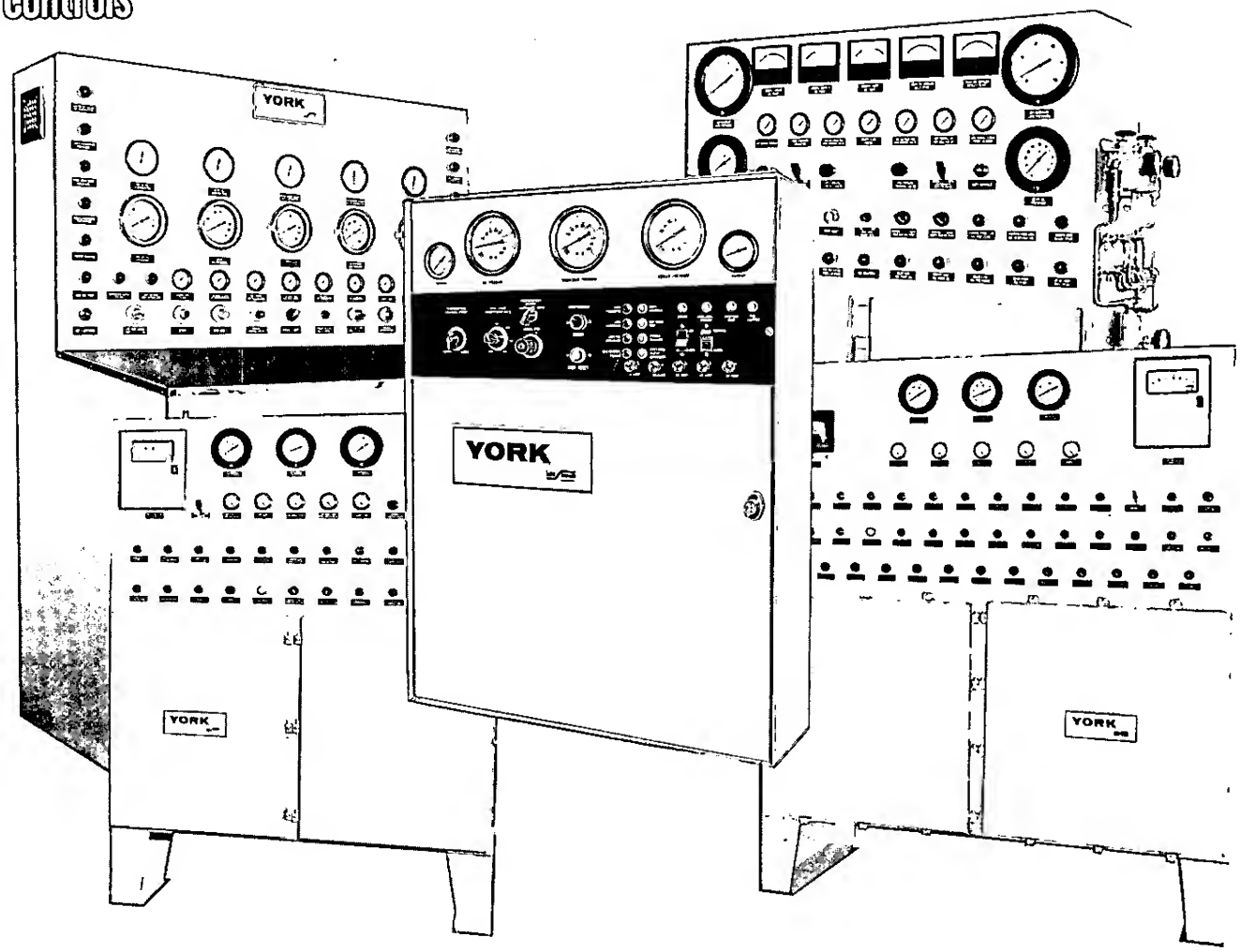
The program can also be used to rate previously selected units under varying conditions to provide information to permit evaluation of changes to various design parameters — chilled and condenser water, GPM flow, temperatures, tube material and wall, fouling factors, velocity and pressure drop — overall load distribution of multiple unit combinations and alternate refrigerants.

what is needed?

Your YORK Sales Representative stands ready to assist end users and designers, through use of the YORK Computer Program, to evaluate the various design parameters leading to specifying the optimum design criteria.

Contact the YORK Sales Representative to consult with you as to your unit requirements. After his visit he will fill in your required data on the Turbomaster Selection input form, submit it to the YORK Computer Program, and return within a few days, along with a custom dimensioned Product Drawing.

controls



The York Customized Control Center includes all necessary controls, control logic, gauges and signal lights to provide failsafe fully automatic operation, pneumatic capacity control and safety protection of the Turbomaster liquid chilling unit. Controls for pre-running the auxiliary oil pump to establish lube oil pressure during start-up, normal coast down and any time the main oil pump does not maintain the required minimum oil pressure are also included. For motor driver, anti-recycle control prevents restarting the unit prior to a pre-determined safe time interval. Interlocks are provided for driver safety cut-outs, chilled water and condenser water pumps,and cooling tower fans. The controls require 30 amperes, (3KVA) 115–1 ph–60/50 Hz power, and 3.5 SCFM, at 70 psig (100 psig max.) clean dry air is required to operate the prerotation vane actuator, reduced to 20 psig to the control center and the hot gas valve.

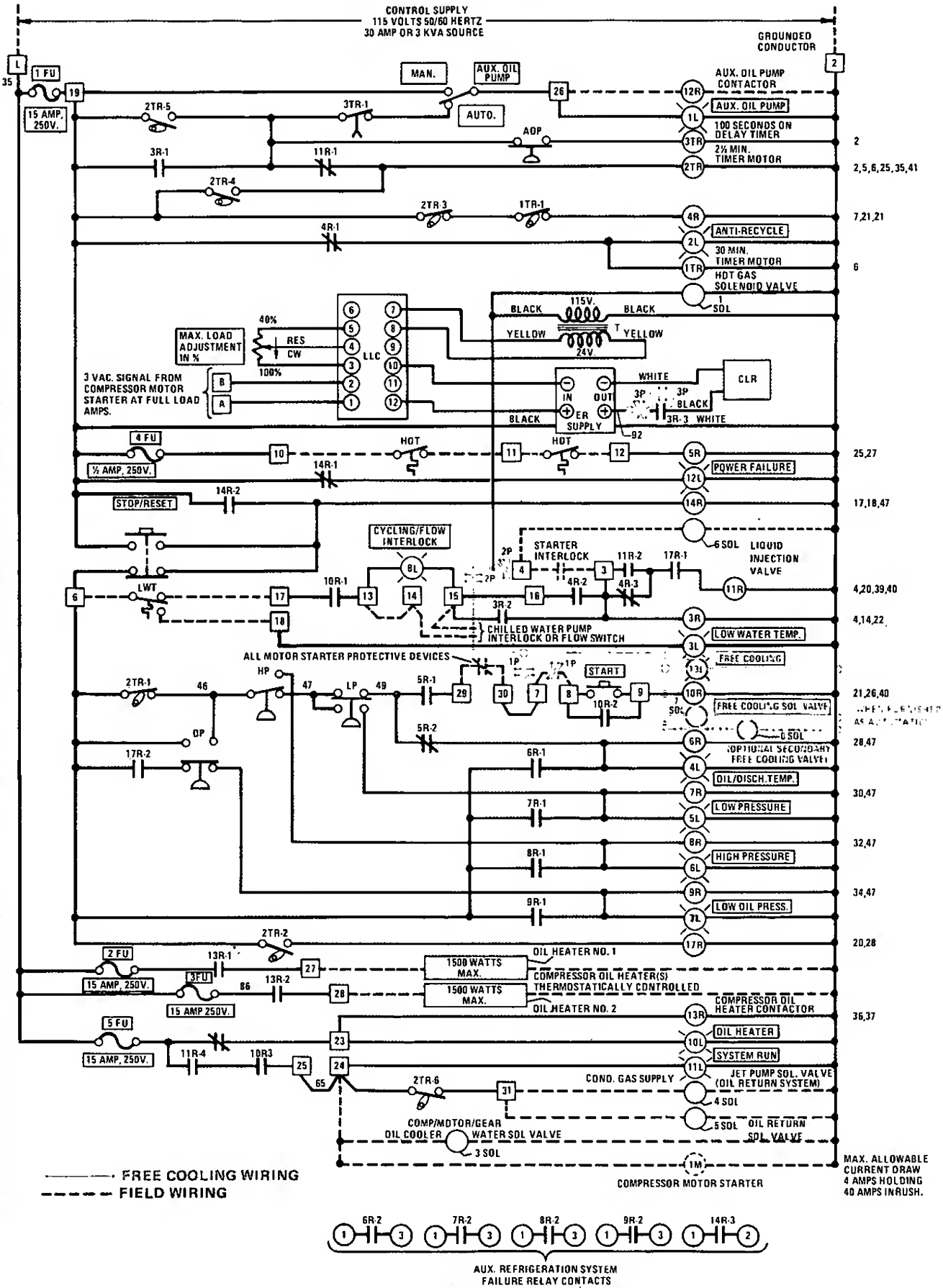
The standard control center is completely factory assembled, internally piped and wired in an attractively styled steel casing for NEMA 1 application. The control center is located adjacent to the compressor and mounted on a floor-stand for eye level viewing of the gauges and controls.

The York Control Center also includes a pneumatic chilled water temperature controller with control point adjustment, and (for motor drive), a current demand limiting controller –40% to 100% range – with an electronic restrictor; or (for turbine drive), a pressure regulator to adjust the maximum PRV opening; and to automatically position the compressor prerotation vanes (PRV). The electronic restrictor (motor drive) or the air dump solenoid (turbine drive), insure the closing of the PRV on shutdown or prior to start-up.

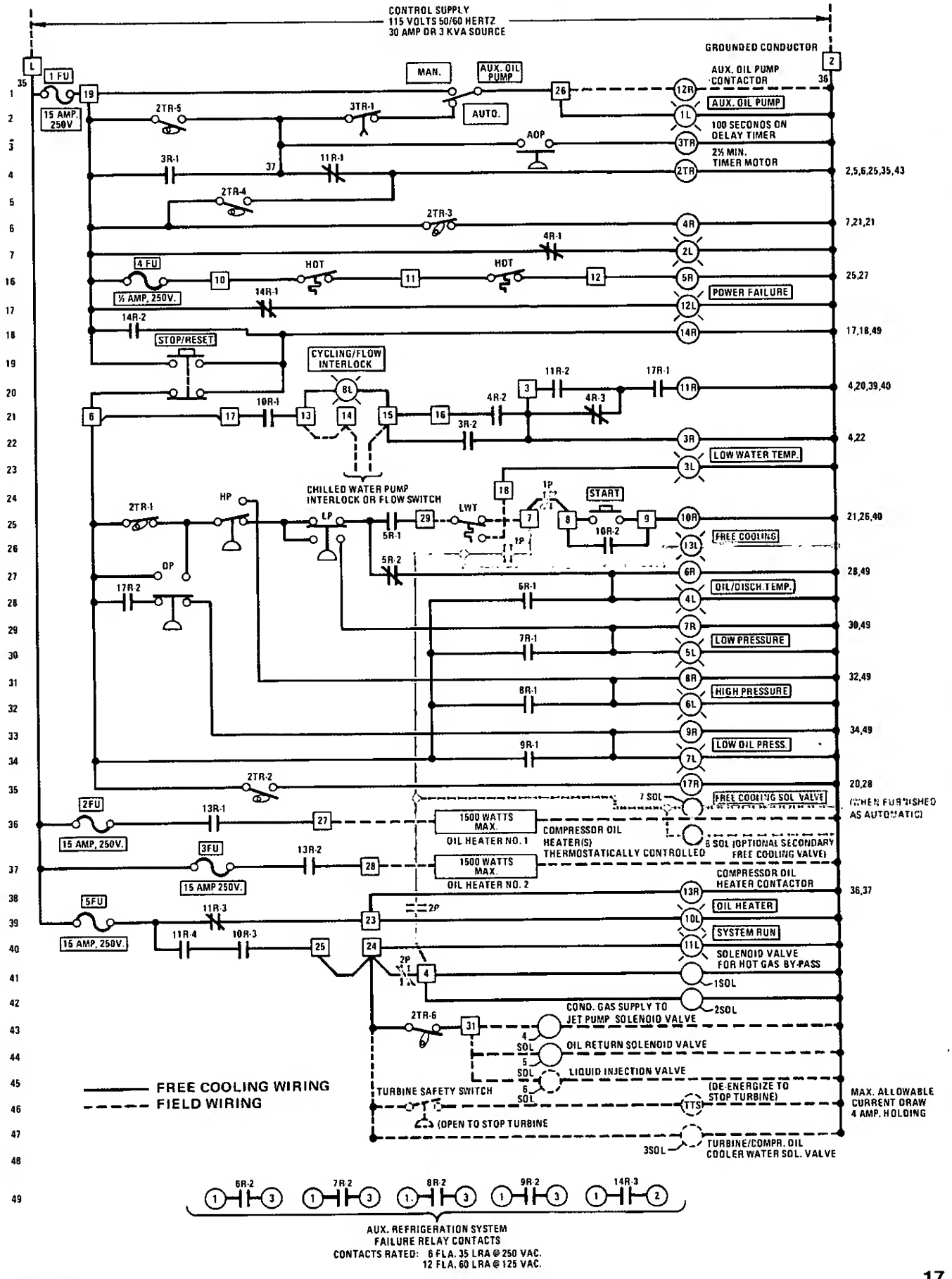
Two, 2-inch dial air pressure gauges – one for indicating the chilled water temperature sensor input signal and one for the control output signal to the positioner; three, 3½" dial pressure gauges – for indicating cooler and condenser refrigerant pressures and compressor oil pressure, are included on the front of the control center.

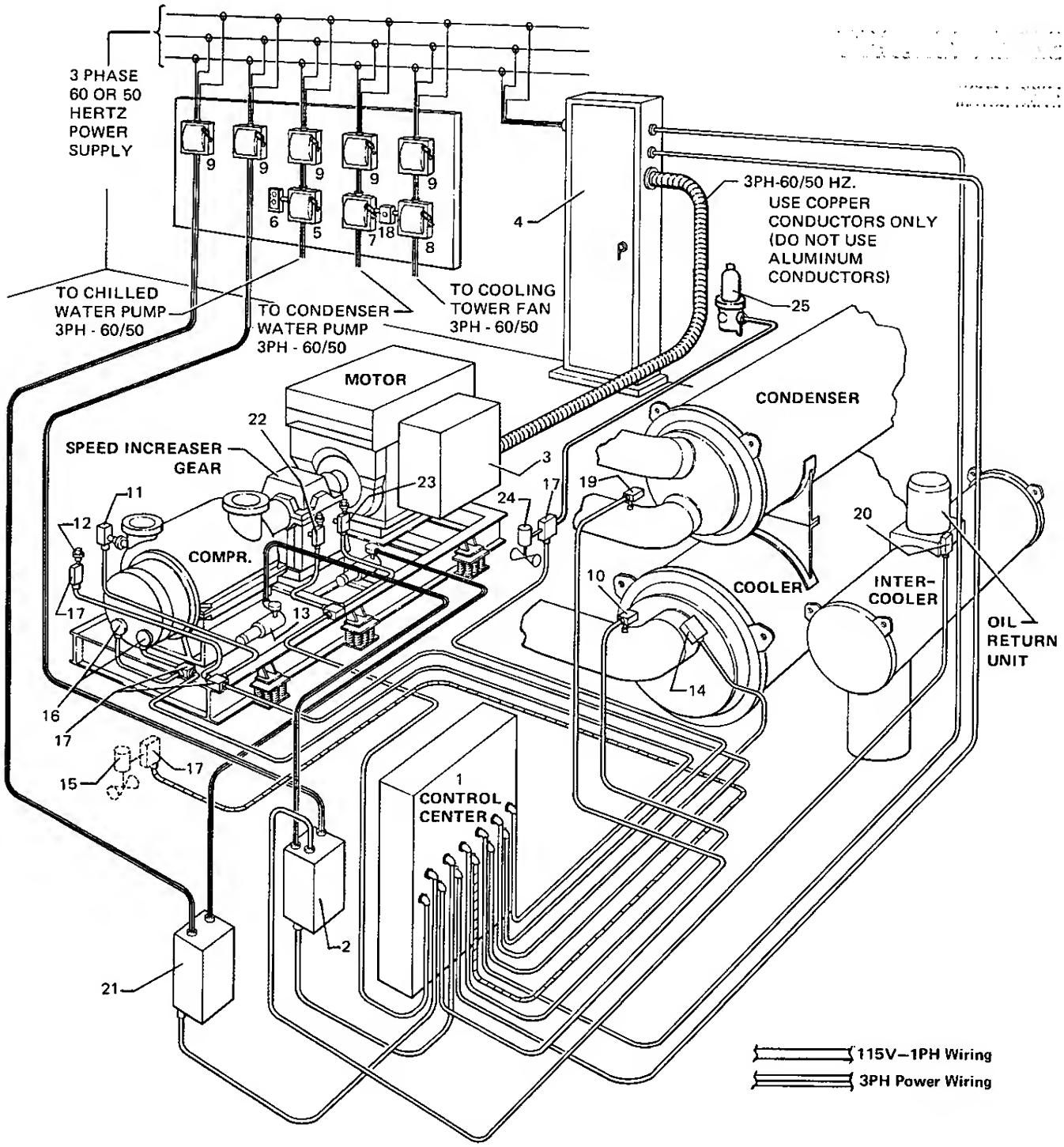
The center includes operating and protective controls with colored neon signal lights. These lights signal the operator as to the operating conditions of the unit. Four red lights for the following: High Pressure (Condenser); Low Pressure (Cooler); Low Oil Pressure; and High Discharge Temperature/High Oil Temperature. Four Amber Lights for the following: Anti-recycle; Low Water Temperature (LWT); Power Failure and Cycling Flow/Interlock. Four White Lights for the following: Spare; Auxiliary Oil Pressure (Automatic or Manual operation of Oil Pump), System Run and Oil Heater.

Chilled Water Temperature Sensor Transmitter (TS) and Low Chilled Water Temperature Cutout (LWT) are furnished and field installed separately.



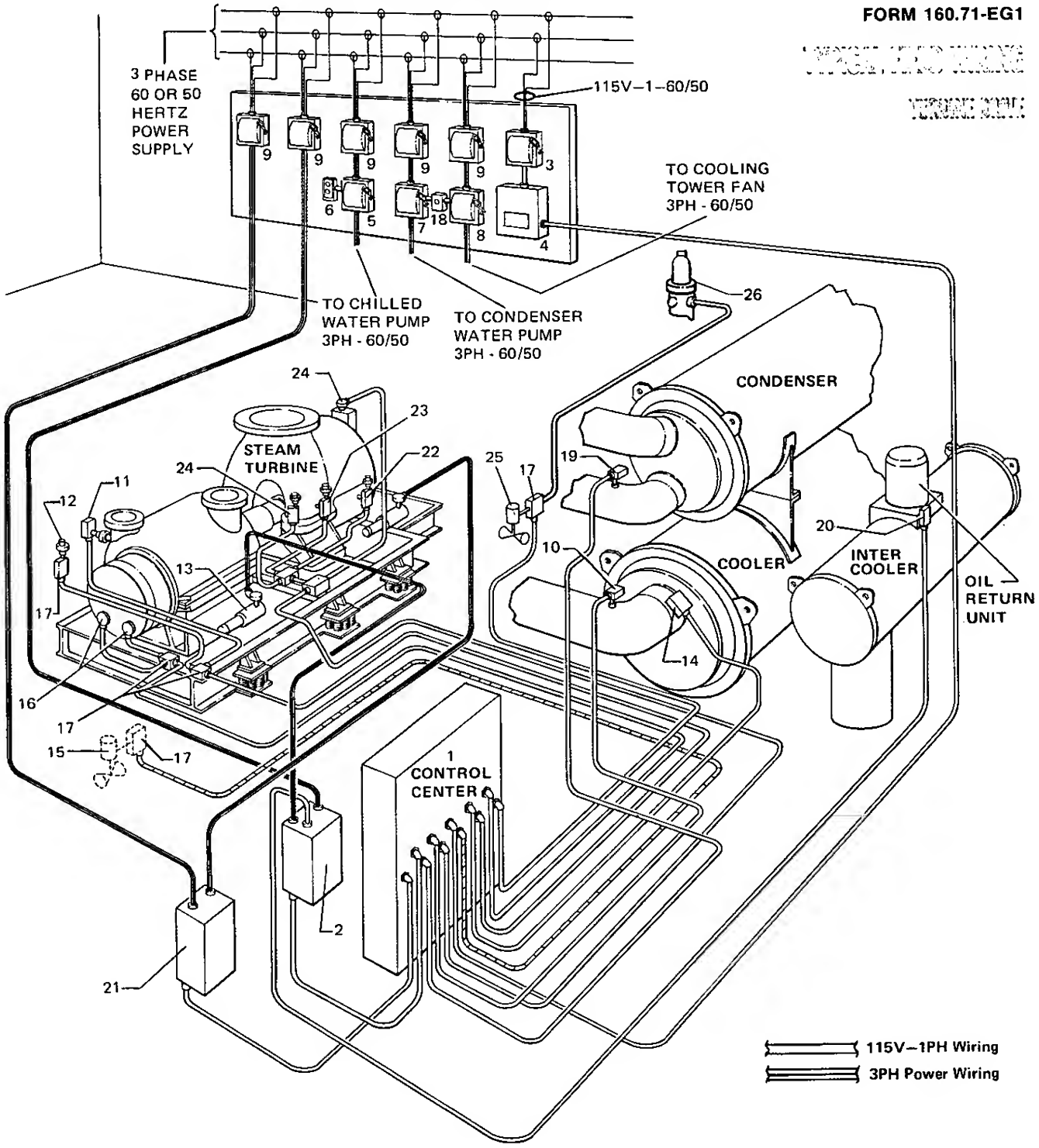
YORK REFRIGERATION WIRING DIAGRAM TURBINE DRIVE—AUTOMATIC HOT GAS BYPASS





LEGEND

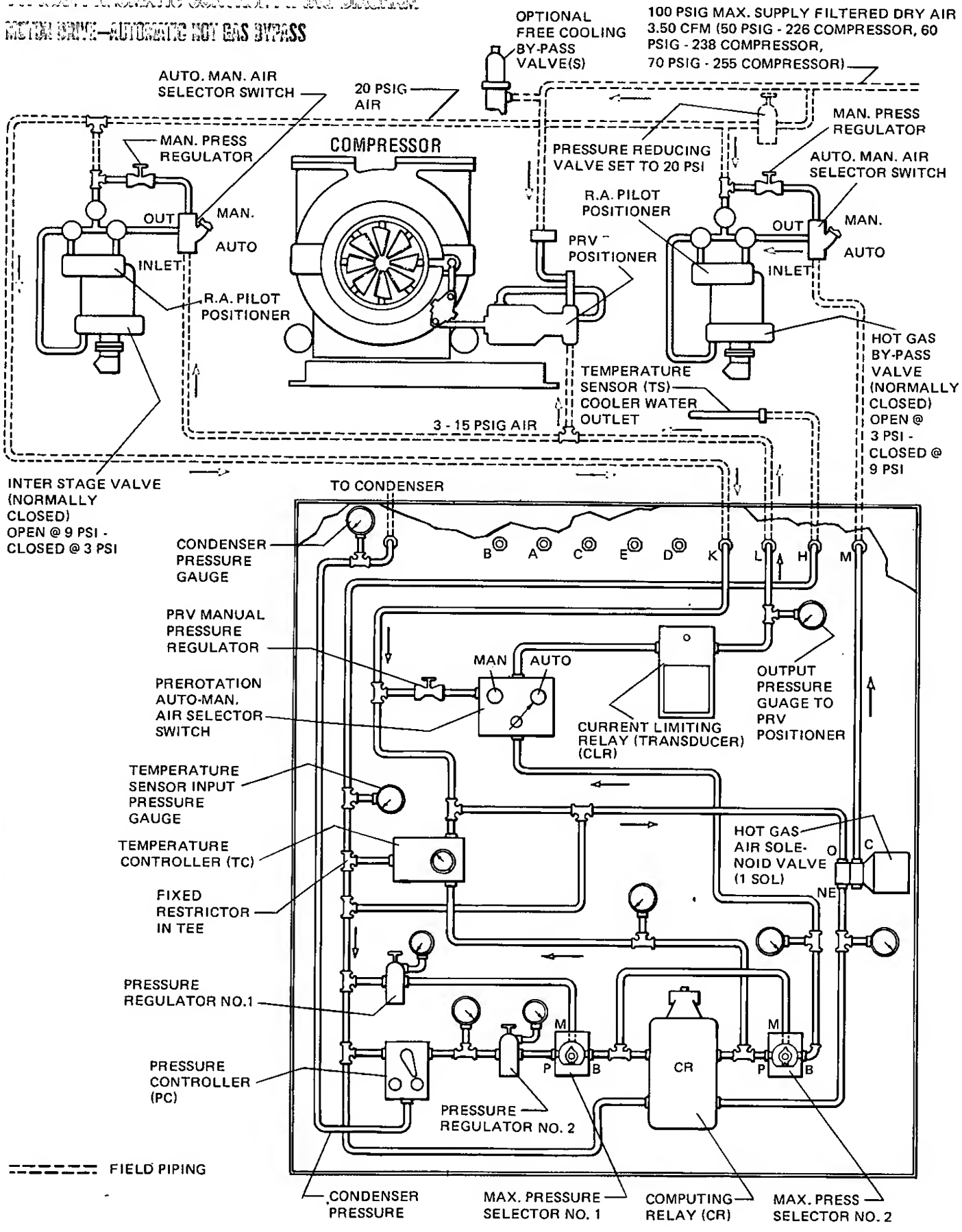
1. Control Center
2. Auxiliary Oil Pump Contactor
3. Compressor Motor Terminal Box
4. Motor Starter
5. Chilled Water Pump Starter
6. Chilled Water Pump Switch (Push Button)
7. Condenser Water Pump Starter
8. Cooling Tower Fan Starter
9. Fused Disconnect Switch (3 Ph.)
10. Chilled Water Flow Switch
11. (HDT) Compressor Discharge Temperature Switch
12. (HOT) Compressor Oil Temperature Switch
13. (AOP) Compressor Auxiliary Oil Pump
14. (LWT) Low Water Temperature Switch
15. (3 SOL) Oil Cooler Water Solenoid Valve (if used)
16. (1H, 2H) Compressor Oil Heaters (1000 Watts ea.)
17. Junction Box
18. Manual Off – Automatic Switch
19. Condenser Water Flow Switch
20. Oil Return System Junction Box
21. Gear Oil Pump Starter
22. Gear Low Pressure Cutout
23. Gear High Oil Temperature
24. (6SOL) Liquid Injection Solenoid Valve
25. (7 Sol) Free Cooling Solenoid Valve(s) (Optional–Manual Std.)



LEGEND	
1. Control Center	15. (3SOL) Oil Cooler Water Solenoid Valve (if used)
2. Auxiliary Oil Pump Contactor	16. (1H, 2H) Compressor Oil Heaters (1000 Watts ea.)
3. Fused Disconnect Switch (115–1PH)	17. Junction Box
4. (CPT) Controlled Power Transformer	18. Manual Off – Automatic Switch
5. Chilled Water Pump Starter	19. Condenser Water Flow Switch
6. Chilled Water Pump Switch (Push Button)	20. Oil Return System Junction Box
7. Condenser Water Pump Starter	21. Turbine Auxiliary Oil Pump Starter
8. Cooling Tower Fan Starter	22. Turbine Auxiliary Oil Pump Low Pressure Cutout
9. Fused Disconnect Switch (3 PH)	23. Turbine High Oil Temperature
10. Chilled Water Flow Switch	24. Turbine Safety Switch
11. (HDT) Compressor Discharge Temperature Switch	25. (6SOL) Liquid Injection Solenoid Valve
12. (HOT) Compressor Oil Temperature Switch	26. (7 SOL) Free Cooling Solenoid Valve(s) (Optional–Manual Std.)
13. (AOP) Compressor Auxiliary Oil Pump	
14. (LWT) Low Water Temperature Switch	

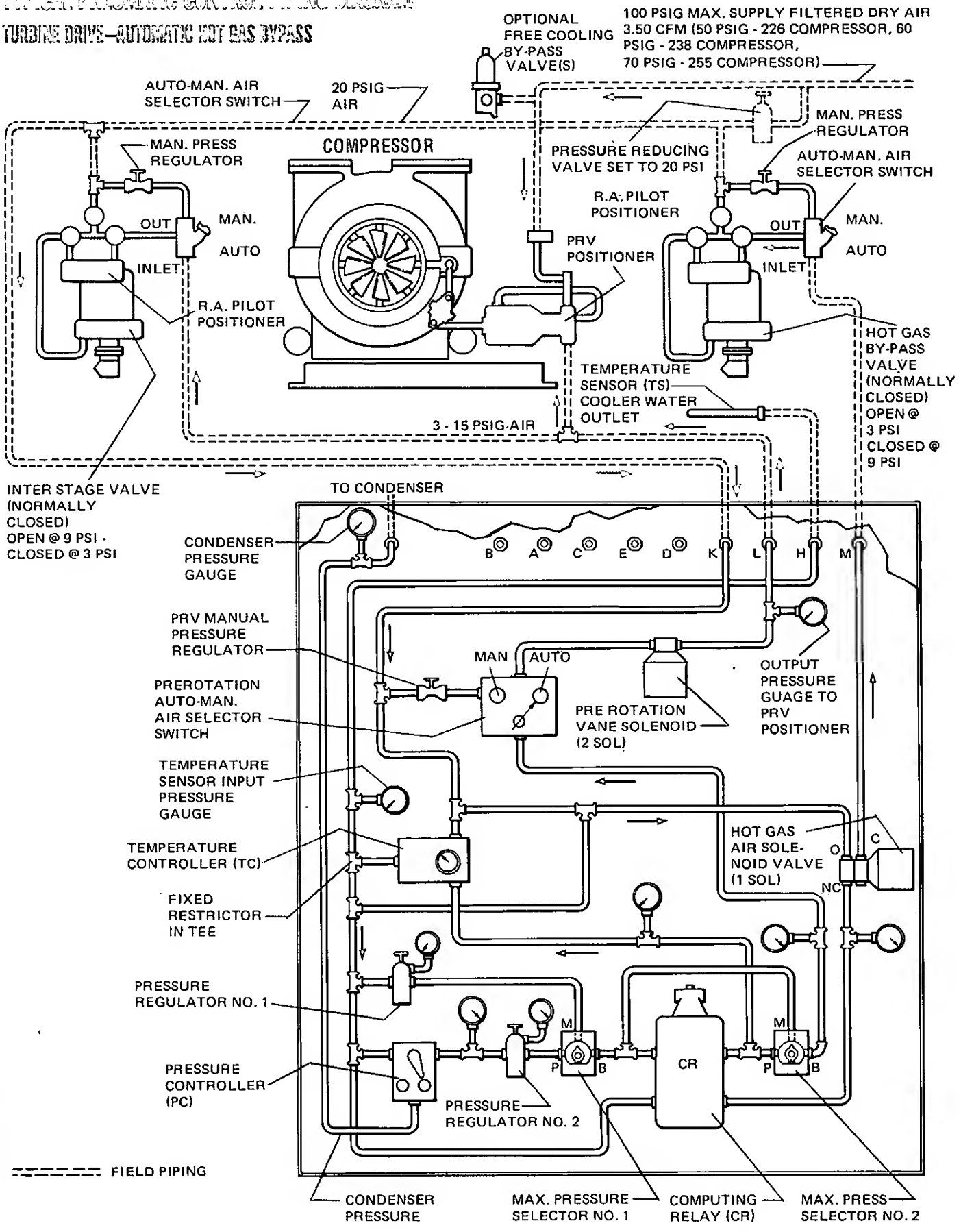
TYPICAL PNEUMATIC CONTROL PIPING DIAGRAM

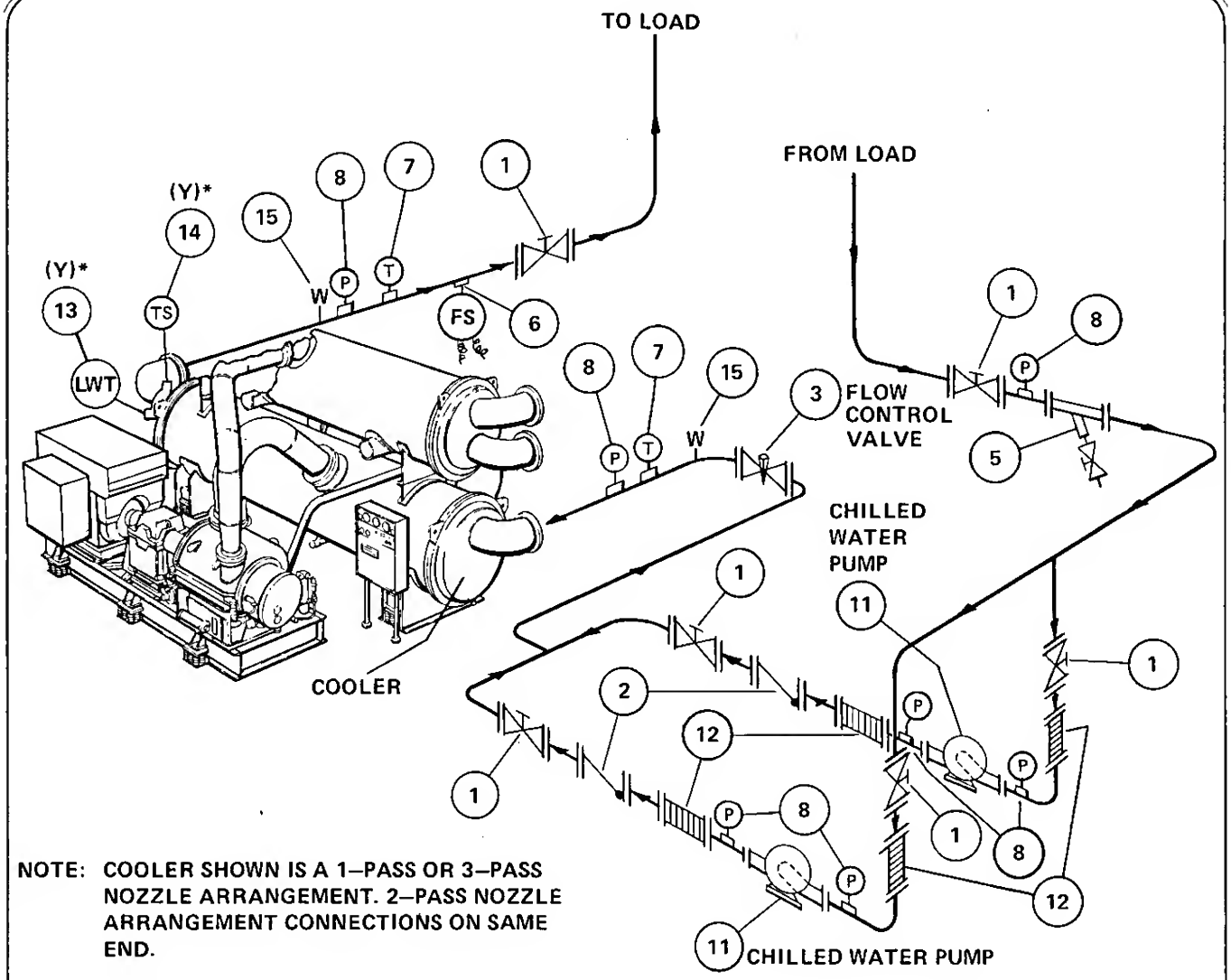
MOTOR DRIVE—AUTOMATIC HOT GAS BYPASS



TYPICAL PNEUMATIC CONTROL PIPING DIAGRAM

TURBINE DRIVE—AUTOMATIC HOT GAS BYPASS





NOTE: COOLER SHOWN IS A 1–PASS OR 3–PASS NOZZLE ARRANGEMENT. 2–PASS NOZZLE ARRANGEMENT CONNECTIONS ON SAME END.

FIG. 1 – TYPICAL CHILLED LIQUID CIRCUIT – CLOSED LOOP

Legend

1.		STOP VALVE (FLANGED)
2.		CHECK VALVE (FLANGED)
3.		SQUARE HEAD PLUG COCK (FLANGED)
4.		3– WAY CONTROL VALVE (FLANGED) PNEUMATICALLY OPERATED OR TANDEM BUTTERFLY VALVES
5.		STRAINER (FLANGED)
6.	FS	FLOW SWITCH (FS)
7.	T	THERMOMETER (DIAL OR INDUSTRIAL)
8.	P	PRESSURE GAUGE
9.		AIR VENT
10.		VACUUM BREAKER
11.		PUMP (FLANGED)
12.		FLEXIBLE CONNECTION (FLANGED)
13.	LWT*	LOW WATER TEMPERATURE CONTROL
14.	TS*	TEMPERATURE SENSOR
15.	W	TEST THERMOMETER WELL
*	(Y)	FURNISHED BY YORK

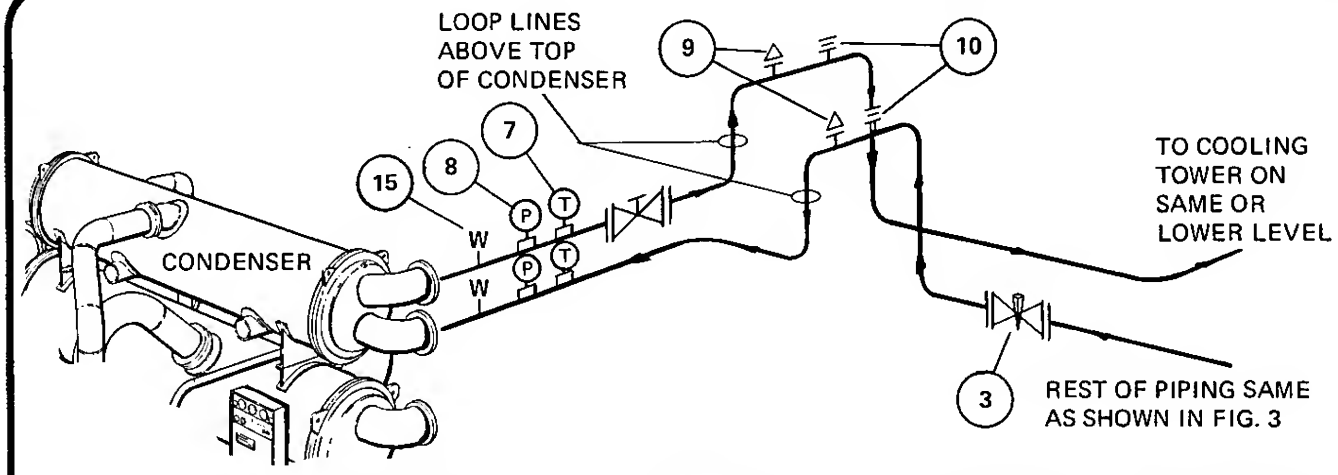
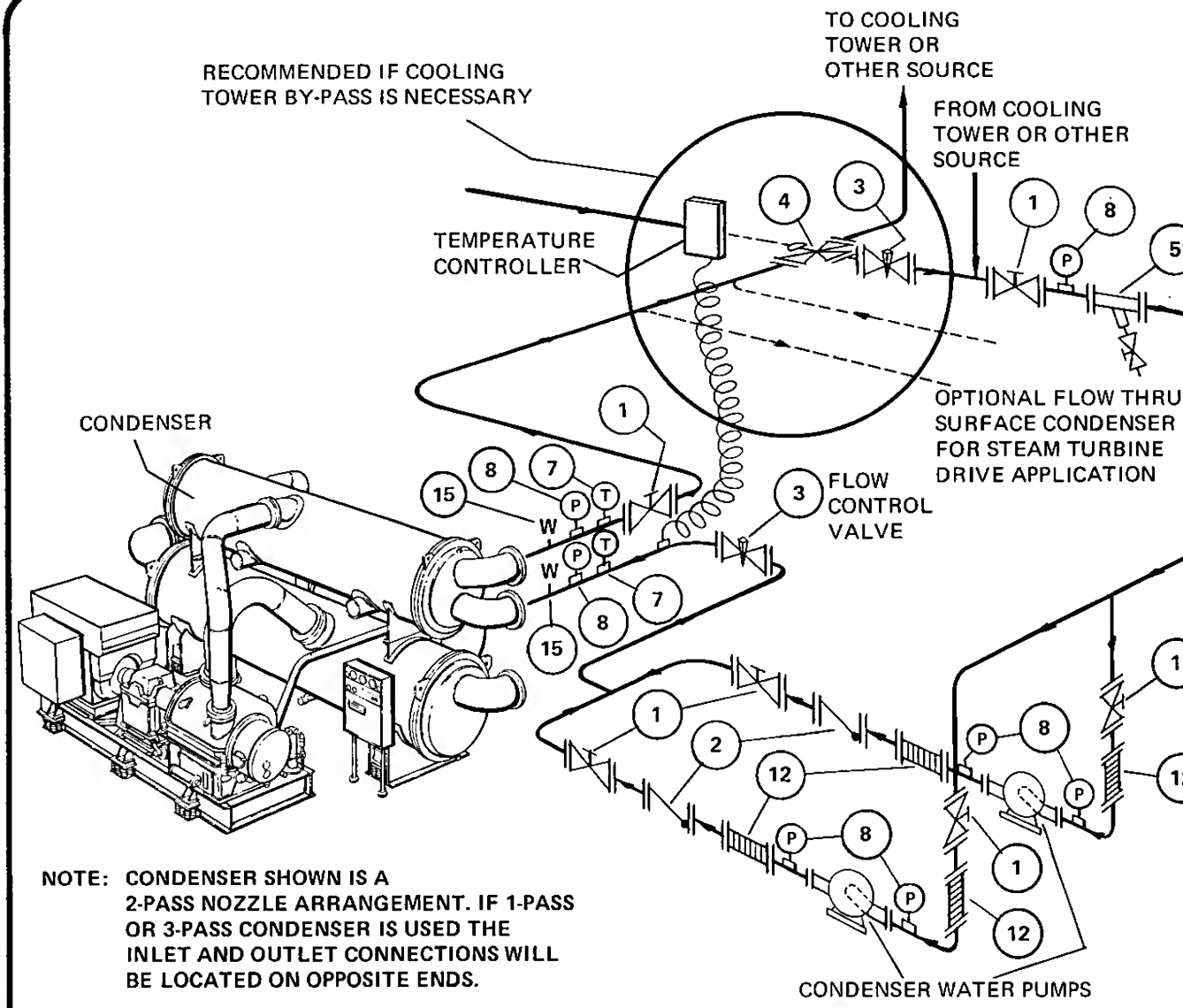


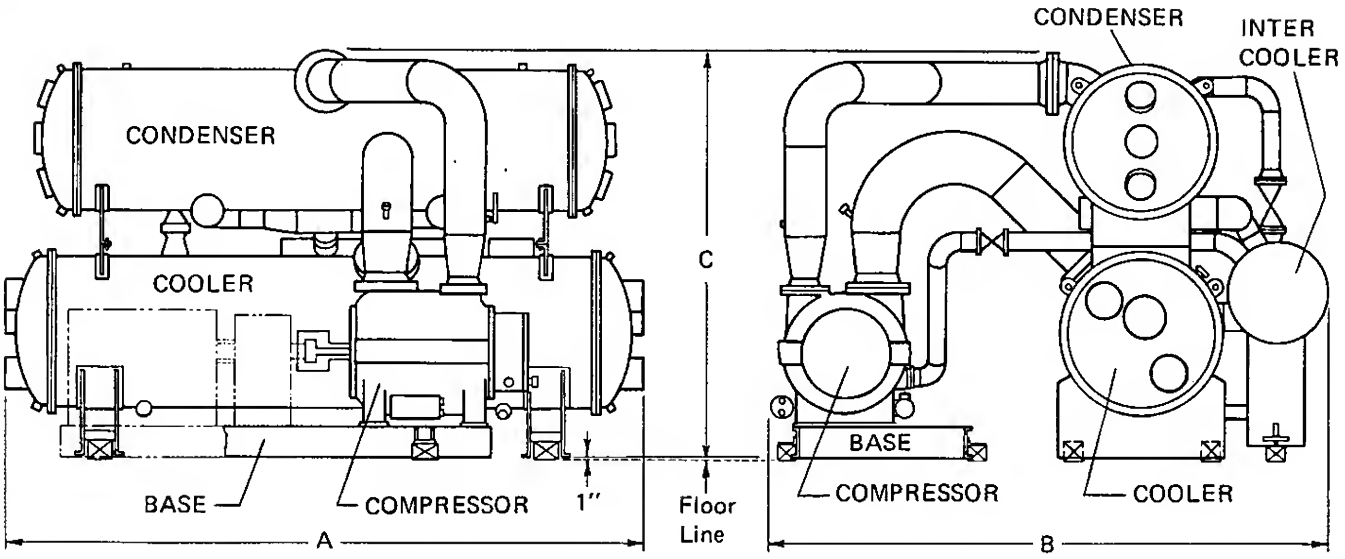
FIG. 2 – TYPICAL CONDENSER WATER CIRCUIT RECOMMENDED IF COOLING TOWER OR OTHER CONDENSER WATER SOURCE AT SAME OR LOWER LEVEL THAN CONDENSER.



NOTE: CONDENSER SHOWN IS A 2-PASS NOZZLE ARRANGEMENT. IF 1-PASS OR 3-PASS CONDENSER IS USED THE INLET AND OUTLET CONNECTIONS WILL BE LOCATED ON OPPOSITE ENDS.

FIG. 3 – TYPICAL CONDENSER WATER CIRCUIT (RECOMMENDED IF COOLING TOWER OR OTHER CONDENSER WATER SOURCE IS LOCATED HIGHER THAN THE CONDENSER)

Dimensions and Physical Data



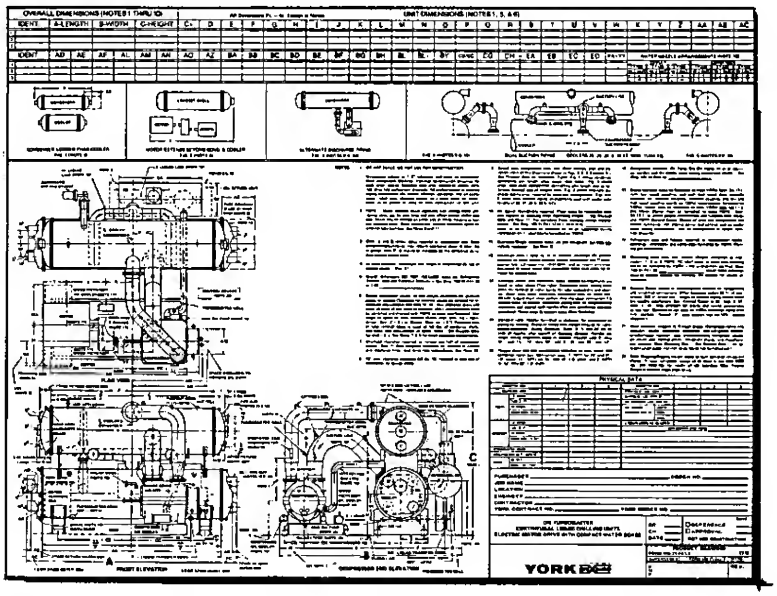
NOTE: Single suction line arrangement shown. Dual suction line arrangement furnished when cooler tube length is 22 ft. or longer.

Typical Dimensions and Physical Data

MODEL	TONS	DRIVE HP	OVERALL DIMENSIONS			APPROX. WEIGHT–LBS. (INCL. MOTOR & GEAR)	
			A	B	C	SHIPPING	OPERATING
OM 1000	1000						
OM 2500	2500		CONTACT YOUR REPRESENTATIVE				
OM 3500	3500						
OM 5000	5000						
OM 8000	8000						

The York OM Turbomaster Computer Program will be used to optimize the selection and combination of standardized components to meet the unique application requirements of each project. A completed Physical and Dimensional Product Drawing will be available from the YORK Sales Representative after a unit has been selected to suit the application. Contact your YORK Representative.

For detailed Mechanical Specifications refer to YORK Form 160.71-S1.



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York Division

Borg-Warner Corporation

